

“ChatGPT, describe the future in 2050.”

Representations of religion and the secular sacred in images of the future created by large
language models

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This master's thesis explores the use of contemporary commercial large language models (LLMs) for creating descriptions of the future. These descriptions are created and then analyzed as individual images of the future, by focusing on how religion and the secular sacred are represented in the different futures.

Three different LLMs are used to create the images of the future: ChatGPT, Gemini and Deepseek. Additionally, three different types of prompts are used to investigate how the LLMs imagine possible, probable and preferable futures and their differences. With 36 images of the future created with each LLM, a total of 108 AI-generated descriptions of different futures forms the data used in the research.

The images of the future have been initially analyzed using qualitative content analysis. Based on both findings from the data as well as relevant literature, six themes have been identified that encompass the representations of religion and the secular sacred. The frequency of how many images of the future include each of the six themes is utilized in the later parts of the analysis, to compare their prevalence to each other and to the findings of previous research.

Selected statistical methods such as Pearson's chi-square tests and factor analysis are used to confirm and contrast the findings from the qualitative exploration of the images of the future. The research approach therefore belongs to mixed methods research, although the qualitative content analysis remains primary in terms of resources allocated to its execution and presentation.

Some of the central findings of the research include the priority of the secular and the spiritual over the traditionally religious in the images of the future, clear observed differences between what the LLMs found probable or preferable in the future, and some smaller differences between the three LLMs employed. In addition, statistical relationships have been identified where some themes occur together in the same image of the future more often than others.

These findings indicate that the treatment of religion and the secular in the context of the future by the LLMs is biased, which is supported by the conclusions of previous studies on AI bias. The main direction of the bias is towards the secular western societies and worldviews, which is most likely related to the data used in the training of the AI models. The prospective use of LLMs in discussions about the future should take these and other presumed biases into account.

Keywords: artificial intelligence, content analysis, images of the future, large language model, mixed methods research, religion, representation, secular

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1 Introduction

1.1 Research topic and context

In our day-to-day life, we rarely pause to think about where we get our ideas concerning the future. Some part might come from a news piece dealing with the effects of climate change, another could be taken from a dystopian sci-fi movie, and the rest filtered through social media discussions. Despite this, how we imagine the future ultimately influences the kind of future we strive towards, which makes it essential to reflect on the dynamics and the politics of who gets to choose which futures we see as possible.

Artificial intelligence (AI) applications have over the last years become an inseparable part of both work and leisure. Especially large language models (LLMs), such as ChatGPT, are now widely used for looking up information, drafting emails or even as conversational partners. Among other things, the future is one topic that these AI chatbots have something to say about. Adding to the list above, our views on future possibilities are then going to be increasingly shaped also by how AI systems address the future. The goal of this study is to find out what kind of elements the futures imagined by language models include, and how this might affect our own ideas about the future.

The research material analyzed includes a total of 108 descriptions of the future in 2050, generated with the LLMs ChatGPT, Gemini and Deepseek.¹ The focus will be on how religion and culture are represented in the different futures, as this perspective is both underutilized in research on the future (Coates and Jarratt 1990; T. M. Johnson and Barrett 2004), and because it is especially relevant when looking at AI models. In previous studies on AI applications' treatment of different cultural and religious topics, those outside mainstream western Christian or secular perspectives have been often found to be either stereotyped or totally ignored (Naous et al. 2024; Wang et al. 2024; Berg 2024). In the context of the future, this has the additional problem of making people that identify with these minorities – and in a global perspective, even majorities – feel like they have no place in the future.

The study is connected to existing research on the biases of AI systems (e.g. Naous et al. 2024; Tao et al. 2024; Rozado 2023), as well as the small but firmly established field of research on religion and AI (e.g. Reed 2021b; Singler and Watts 2024). The theoretical

¹ The year 2050 has been chosen as it is neither too far or close in the future, but the choice of year is ultimately arbitrary, and similar findings would likely result with the year 2040 or the year 2060.

background is situated in critical futures studies, and conceptualizing the descriptions created by the LLMs as images of the future is a way of comparing them to images of the future held by human individuals or communities (Rubin 2013; Bell 1997a; Ahlqvist and Rhisiart 2015). The study utilizes a mixed methods approach (R. B. Johnson, Onwuegbuzie, and Turner 2007), where qualitative content analysis and statistical methods are combined to describe both the details as well as the recurring patterns in how the LLMs represent religion and the so-called secular sacred (Knott 2013).

The complicated relationship between religion and the future increases the appeal of focusing on the representations of religion and the secular sacred – which in this study includes elements such as transhumanism, ecospirituality, and so on. Professional futurists often ignore the role of religion in the future (T. M. Johnson and Barrett 2004; Coates and Jarratt 1990), and theories of secularization have not traditionally described the future of religion in optimistic terms (Casanova 1994). In the images of the future created by LLMs, the term religion is mentioned in total only three times, which is even less than was hypothesized during the initial experiments of the research. Despite this, religious communities are generally active in discussing the use and the ethics of AI tools (Trotta, Iannotti, and Rähme 2024), so this relationship has the potential to evolve, at least related to the future of artificial intelligence.

Language models have not thus far been used to create comprehensive images of the future for research purposes, so the methodology utilized here is novel and experimental. In corporate foresight however, LLM-based AI tools are already in use (e.g. Futures Platform 2025; Konsensus.me n.d.; Kairos Future n.d.), which speaks to the relevance of the topic. In addition to professional use, the broad adoption of tools such as ChatGPT has the potential to affect what wider audiences think about the future, especially with younger people for whom an AI chatbot might be a more natural way of looking up information than traditional search engines. For these reasons, we can expect more studies similar to this one to emerge in the coming years.

The field of artificial intelligence is both problematic with its ethical, legal and practical issues, but also one that has potential to increase diversity in our thinking. While the focus of this study is on critically questioning the biases noticeable in the images of the future that commercial LLMs have created, there is the theoretical possibility that artificial intelligence could be used to help us question our own biases instead of reinforcing them. AI applications could be valuable especially in enabling an accessible way for more non-experts to discuss

and think about alternative futures, which is fundamentally the goal of foresight practice (Bell 1997a). Keeping this in mind, we can now move on to examine the large language models that are in use currently, and how their ideas of the future measure up to critical investigation.

1.2 Research questions

The main objective of the research is to explore how large language models imagine the role of religion and the secular sacred in the future. This objective will be carried out through answering the following research questions:

1. What kind of elements and themes related to religion and the secular sacred emerge from descriptions of the future generated with LLMs?
2. How do these descriptions – or “images of the future” – represent the different elements and themes related to religion and the secular sacred? Are there any biases, with some themes being represented more often or in more detail?
3. Are there any differences between possible, probable, and preferable images of the future created by LLMs, regarding their representation of religion and the secular sacred?
4. Are there any differences between the images of the future created by different LLMs, regarding their representation of religion and the secular sacred?

The first two research questions will be the focus of Chapter 5, where six themes related to religion and the secular sacred that have been identified in the analysis will be explored, looking at what kind of elements they include and what is left out by the LLMs in their descriptions of the future. The question of bias is looked at through comparisons of the representation of the six teams to each other, as well as through previous research on how relevant the themes are in human ideas about religion and the future. The explorations related to the first research questions form the basis for the comparisons in the last two, and especially the discussion on the future-related biases of the LLMs will carry through the entire text.

The other two research questions are comparative in nature, and they reflect the creation of the material for the research: the images of the future have been generated with three different LLMs, asking for descriptions of possible, probable and preferable futures. Comparisons

between these variables are left for the most part to Chapter 6, where the qualitative focus of the initial analysis will be switched to numbers-based interpretation of the relationship between them and the representations of religion and the secular sacred. For the most part, this analysis will stay on the surface level with comparisons of frequencies of representation in different types of images of the future, but some statistical methods and models will also be utilized where appropriate.

1.3 Previous research

This study is situated within the research area of religion and AI, which combines established methods and perspectives from the study of religion with a novel research subject in AI systems and their use. Research on religion and AI has been conducted at least since the 1990s (Dhaouadi 1992; Helmreich 1997), but only in the 2020s has there been discussion about the research area and how it should be conceptualized (Reed 2021b; Singler and Watts 2024). Some of the most common approaches into the subject of religion and AI include speculative or philosophical examination of the spiritual possibilities of AI systems, empirical studies on how individuals and communities interact with AI applications and robotics in practice, and the most recent addition of experimental research on contemporary AI models, such as the LLMs analyzed in this study.

The more theory-driven strand of research has included philosophical and theological speculation on what the spiritual consequences of AI systems of various capabilities would be, and whether genuinely spiritual machines are even possible to begin with (Rachewiltz 2021; Graves 2024). On the other hand, real individuals who believe in the advent of superintelligent AI have been also studied as a quasi-religious movement (Geraci 2010). A connection here to the study at hand is found from these beliefs forming a significant part of the transhumanist philosophy, which is one of the six themes identified in the images of the future.

With the second approach of focusing on more practical present-day applications of AI and robotics, an excellent example is presented in the pioneering study where Diana Löffler and her research group looked at the reception of a blessing robot called BLESSU2, through a survey answered by almost 2000 participants (Löffler, Hurtienne, and Nord 2021). They found the opinions about the robot to be a mix of positive and negative comments, which illustrates the conflicted relationship between AI and spiritual contexts. Another early example can be

found from the use of Islamic prayer apps and related Twitter-bots, where religious practitioners adopted a novel technology spontaneously (Öhman, Gorwa, and Floridi 2019). In a broader review article, religious communities have been observed to both adopt emerging AI technologies, but also actively participate in discussions surrounding the ethical questions related to their development (Trotta, Iannotti, and Rähme 2024).

Coming closer to the approach utilized in this study, previous experimental studies on AI applications from the perspective of religion have looked especially at religious bias, which is also the focus here. The earliest example comes from Randall Reed and his research group, who prompted the GPT-2 language model (precursor of ChatGPT) with religious vocabulary to see how it would respond (Reed 2021a). While the treatment of religion was overall incoherent due to the relatively basic technological level of the model, it was still found that the model's responses were connected most often to the Christian tradition instead of other world religions (Reed 2021a, 9). In a more thorough examination of several LLMs and their representation of emotions in the context of religion, another research group discovered that major western religions – i.e. Christianity – are portrayed with nuance, while eastern religions are stereotyped, and Islam and Judaism stigmatized and ignored (Plaza-del-Arco et al. 2024).

The most relevant comparison in previous research is found from Anton Berg's (2024) doctoral thesis research, which similarly looks at the representation of religion in AI systems, but instead of LLMs the subject of the study are commercial image recognition tools. The image recognition tools are used to classify a set of images depicting religious figures and rituals, and these classifications are analyzed in how they represent religion. The thesis research and related published articles include similar conclusions as this study, for example regarding the existence of a secular bias in the AI systems, since numerous images were coded with only secular terms, despite clearly depicting religious imagery (Berg 2024, 59–61; Berg and Valaskivi 2023b).

In addition to religious biases, researchers looking at AI applications in other fields have identified significant cultural and political biases in LLMs. These studies are relevant as their findings are easily comparable to those related to religious bias in this study, and because the biases likely have the same source – the training data used (Ray 2023; Wang et al. 2024). Culturally, the LLMs examined – most commonly different versions of ChatGPT, but also others such as Google's Gemini or Meta's Llama – have been found to correspond with western and English-speaking countries (Tao et al. 2024; Naous et al. 2024; Wang et al. 2024). The studies

have confirmed these biases with the use of surveys (Tao et al. 2024) and datasets of culturally relevant prompts presented to the LLMs (Naous et al. 2024; Wang et al. 2024).

With political values, the direction and source of the bias is less clear. In one study, ChatGPT was found to be both politically conservative as well as liberal, according to a “Moral Foundations Theory” survey and depending on the order of the prompts given (Park, Schoenegger, and Zhu 2024). Other studies however have reported that the answers of most of the commonly used LLMs to political orientation tests correspond with left-leaning perspectives (e.g. Hartmann, Schwenzow, and Witte 2023; Rozado 2023; 2024). The degree to which these cultural and political biases are connected to the representations of religion and the secular sacred in the images of the future is uncertain, but the analysis will illustrate that the western perspective in general is clearly present.

Previous research on images of the future should be also taken into account, since fundamentally the images of the future described by the LLMs are equivalent to those observed in research with human participants. Studies on the images of the future have often focused on a certain group of people or a specific aspect of the future, which complicates comparison with the very general futures created in this study. For her doctoral thesis, Anita Rubin interviewed and surveyed young Finnish people regarding their ideas about the future, and although the data from the research is already 30 years old, it still makes for one of the broadest overviews on the images of the future (Rubin 1998). On the other side of the Atlantic, young adults have been more recently surveyed in the US about their perceptions of the future (Kantenbacher et al. 2022). In addition to these broad surveys, images of the future presented in contexts such as films have been critically examined in research, and examples from these have inspired the critical approach of this study (e.g. Hurley 2008).

Although LLMs have not been previously used for research purposes to create images of the future like in this study, we can briefly discuss the ways in which AI has been utilized in futures studies research. The use of AI applications has been already tested as part of a hybrid foresight approach combining human experts with AI systems handling relevant data, and although the starting point is completely different, concerns about the significance of bias and trustworthiness in the process are mutual with this study (Geurts et al. 2022). In another study, generative AI tools were used to aid human participants for example in identifying trends and visually illustrating alternative futures, which is another context that shows the relevance of investigating how AI systems imagine the future (Lyu, Hao, and Yi 2023).

One more previous study that should be mentioned is that of Kim Knott, Elizabeth Poole and Teemu Taira (2013) on the representation of religion in news media. The researchers utilize material from the 1980s and the late 2000s to form a comprehensive picture of how religion, spirituality and even the secular sacred are represented in news media during these periods, which in theory forms a very fruitful comparison to the representations found in this study. However, as will become clear, the differences in the context of the material result in significantly more dissimilarities than similarities in the findings. Despite this, the methodology used in the study and the role of religion and the secular sacred in the analysis have provided a valuable precedent for the research approach utilized here.

The articles, books and research projects introduced above form the core of previous research referenced during the research process. The connections of this study to the research areas of religion and AI, cultural and political AI bias, images of the future, and the representation of religion should be clear and justified. In the following sections, other works, authors, and theories will be cited in addition to those mentioned here, and they too will be similarly introduced where necessary. Due to the multidisciplinary nature of this study, the volume of relevant literature is extremely vast and the treatment of some ideas might seem simplified, which is a common issue in interdisciplinary research (Repko 2020). While creating images of the future with large language models is a completely novel approach, previous research from these various fields still situates and motivates the study.

2 Large language models

2.1 What are large language models (LLMs)?

Large language models (LLMs) are a type of generative artificial intelligence application that are trained to recognize and generate written text, or alternatively another symbolic language such as a coding language. Generative artificial intelligence (GenAI) refers to a subset of artificial intelligence applications that produce text, images, video or other forms of output.

LLMs and other GenAI applications are built with neural networks, a common type of machine learning, by using vast quantities of textual training data to train the model to recognize patterns in language (Ray 2023; Minaee et al. 2024).

Large language models, like all other contemporary AI applications, are programmed and trained to execute a specific function.² For LLMs, this function is the generation of text in a logical sequence, and despite it sometimes seeming like the AI application might have a mind of its own, nothing what we would traditionally call a mind exists inside the models. The term neural network might in this sense be misleading, although the technology is loosely based on the neurons of the human brain (Aggarwal 2023). Instead, the LLMs generate responses based on the context of the prompt or question – this means that the same model might seem to have completely different ideas when the context of the discussion changes (Kovač et al. 2023).

Special attention should therefore be paid to the prompting of the LLMs, since even with small changes in the questions, the answers of the models might be completely different (Den- gel et al. 2023).³ In this study, this has been taken into account through simplicity and repetition in prompting, as will be explained in detail in Chapter 4.

Although in parts of this study the idea of LLMs viewing the future in certain ways will be discussed, it should be clarified that in reality the AI models do not hold any values, beliefs or worldviews, even though their responses might seem like it. Instead, they are based purely on statistical models and their training data: an element which occurs often in the training data is more likely to be found in the responses as well (Ray 2023; Minaee et al. 2024). In many studies on AI bias the focus is more concretely on the algorithm behind the model (e.g. Tao et

² This distinction is often described with the term “narrow AI”, in comparison to “general AI” which would be able to fulfill functions of all kinds, similarly to the human brain. The development of general AI would be significantly more difficult, or even impossible.

³ And as there is always randomness in the LLMs, repetitions of the same prompt too will receive different and even contradictory answers. This randomness is inevitable, but here the aim is to minimize forms of randomness that can be affected, such as those emerging from different prompts.

al. 2024; Wang et al. 2024; Naous et al. 2024; Hartmann, Schwenzow, and Witte 2023), but the approach utilized here looks at what kind of responses the models might give to ordinary users. From the perspective of how people interpret these responses, it is additionally not entirely incorrect to speak about the LLMs' ideas about the future, since we have a strong tendency to anthropomorphize non-human actors (Laaksonen et al. 2023). As people often address the AI applications similarly to other humans, their responses can be also analyzed as if they were human.

If we are being precise, the applications used in this study are not large language models in themselves, but rather chatbot interfaces based on the technology. However, the term large language models is commonly used to refer to commercial chatbot applications like ChatGPT, and for the sake of clarity a similar usage is adopted in this study.

2.2 Large language models used in the study

The study includes the comparison of three different LLMs: ChatGPT, Gemini and Deepseek. The models were chosen because they represent well the state-of-the-art of the technology at the time of the creation of the research data (January 2025). From the model lines (e.g. GPT3, ChatGPT 4o, ChatGPT o1...) the models are all the most recent general-purpose models.⁴ The differences between the models were also considered to make up more diverse comparisons, most notably with the country of origin: ChatGPT and Gemini are developed in the US, and Deepseek in China. All three LLMs were released in 2024, and their performance in general is fairly comparable, although ChatGPT is the industry leader (Minaee et al. 2024).

ChatGPT is the chatbot interface based on the GPT family of large language models – GPT standing for Generative Pre-trained Transformer – developed by the company OpenAI.⁵ In January 2025 when the material for this research was created, ChatGPT used the most recent model GPT-4o. ChatGPT was chosen because it is the most well-known generative AI chatbot, especially for the general public. The specific model used was the “standard” ChatGPT4o, which at the time was also the one a new chat with ChatGPT would default to.

⁴ All three model lines had at the time newer models that were optimized for reasoning applications like coding and maths, but they weren't used because their performance in general-purpose text generation is not as good.

⁵ <https://chatgpt.com/>

At the time of reading this, this has most likely changed. In addition, OpenAI frequently updates the ChatGPT web application through smaller patches.⁶

Gemini is a chatbot developed by Google, which like the other two models can be used online after registration.⁷ During the last years, Gemini has been the most popular LLM besides ChatGPT, and it has been often used with ChatGPT for the comparison of different LLMs in previous research (Vicsek et al. 2024; Dengel et al. 2023). The version of Gemini used in the study was Gemini 1.5 Pro, which was at the time the best general-purpose model that was available for consumer use.

The premium model Gemini 1.5 Pro was chosen in favor of the default Gemini 1.5 Flash, because the 1.5 Pro was the more elaborate model, similar to the other two competitors, while the 1.5 Flash is a smaller model focusing on efficiency instead of detailed answers. Despite this, the responses of Gemini were shorter than the other two LLMs, but the difference would have been even more noticeable with the use of 1.5 Flash. Due to this choice, the Gemini 1.5 Pro used is also the only model that was not available at the time for free, and so a trial subscription was used by the author to access the model. In terms of naming, it should be noted that the previous versions of Gemini used to be called Bard until February 2024.

Deepseek is a chatbot developed by a company with the same name, owned by the Chinese hedge fund High-Flyer.⁸ The company has risen to international fame recently, both due to surprising market leaders with the effectiveness of its AI model, but also from explicit censorship embedded in the chatbot. For this reason, it should provide an interesting comparison to the other two LLMs, to see whether this censorship also influences how the chatbot imagines the future. The specific version of Deepseek used in the study is Deepseek v3, which came out in December 2024, making it the newest out of the three models. A version of this model that is perhaps better known is the model Deepseek R1, which is geared towards coding and reasoning applications. As these are not the focus in this study, the base model has been chosen despite R1 being more commonly used otherwise.

⁶ Information about the updates can be found on OpenAI's website: <https://help.openai.com/en/articles/6825453-chatgpt-release-notes>

⁷ <https://gemini.google.com/>

⁸ <https://www.deepseek.com/>

3 Theoretical framework

3.1 Background theory

3.1.1 Critical futures studies

The epistemological background for this study is based on a paradigm in the field of futures studies that can be called critical futures studies, or alternatively emancipatory futures studies. Similarly to other critical research, critical futures studies has the aim of questioning assumptions and critiquing existing power relations (Slaughter 1999; Ahlqvist and Rhisiart 2015). The professional field of futures studies can be divided into two – or often more – traditions or paradigms, where critical futures studies is one and a practice-focused or utilitarian tradition is the other (Slaughter 1999; Ahlqvist and Rhisiart 2015, 94–97). Although the two are thoroughly interrelated, much of academic futures research and theorizing has been more closely connected to these critical perspectives, ever since the beginnings of the field in the 1960s (Ahlqvist and Rhisiart 2015, 91–92).

This study takes inspiration especially from the work and ideas of futurist Wendell Bell who has among other things written about the theoretical basis of futures studies. His two-volume opus “Foundations of Futures Studies” (Bell 1997a; 1997b) has been described by many scholars as the “basis for futures studies as an interdisciplinary area” (Masini 2011). Bell has emphasized the importance of ethics in the study of futures and has even dedicated the second volume of this work to ethical considerations (Bell 1997b). Other, more contemporary perspectives on critical futures studies include the Causal Layered Analysis (CLA) methodology developed by Sohail Inayatullah (Inayatullah 2004) and the perspective of decolonizing futures (Bisht 2020).

Some of the assumptions of futures studies that frame this research include the following: the future is not predetermined, and instead we can change it in the present (Bell 1997a), there exists alternative futures (Bell 1997a; Dator 1979; Polak 1973), the futures we imagine influence our actions in the present (Bell 1997a; Rubin 2013) and that ideas about the future always prioritize some group or values above others (Bell 1997a; Rubin 2013). These assumptions have guided the research process through pointing attention towards representational diversity – or the lack thereof – in the images of the future created by LLMs, as well as to the power dynamics inherent in which elements are included in the descriptions, and which are

not. The significance and the risks of AI systems potentially co-creating our ideas of the future also stem from this context.

These perspectives are connected to the broader theory of social constructionism, which forms a significant part of the theoretical backdrop of futures studies (Fuller and Loogma 2009). Futures research does not consist of neutral observation but instead participates in this process of constructing possible futures. Images of the future, too, are socially constructed, although with AI models the process of construction varies significantly from that of humans. In the next section, the concept of images of the future is introduced, which will further demonstrate the relevance of the viewpoints of critical futures studies.

3.1.2 Images of the future

The term image of the future is used to describe the units of analysis in this study, generated with large language models (LLMs) using prompts such as “Describe a possible future in 2050”.⁹ On one hand, the term is used here as a synonym for “description of a future”. However, the utilization of the term often includes theoretical assumptions apart from simply describing a state of affairs in the future, which is the case in this study as well.

Images of the future are a fundamental concept of futures studies that was originally introduced by Fred Polak in his suitably titled book “The Image of the Future” (Polak 1973). The concept has been further developed most notably by Wendell Bell, who writing together with James Mau defines the image of the future simply as “an expectation about the state of things to come at some future time” (Bell and Mau 1971, 23). Bell’s work on the concept has been seen as an effort to counter positivist trends of researching only futures that can be quantified and modelled, in favor of seeing the future as socially constructed, an orientation which this study shares (Aligica 2011). In addition to Bell, Anita Rubin has worked on the theoretical and empirical background of the concept throughout her career, and especially the work of these two researchers has influenced how images of the future are seen in this study.

Images of the future are often used to emphasize the possibility of alternative futures, either through the construction of several alternative images of the future (e.g. Polak 1973; Dator 1979; Slaughter 1998), or by critiquing the assumptions built into a predominant idea about

⁹ More on these prompts in Chapter 4.1 on the creation of the research material.

the future (e.g. Bisht 2020; Hurley 2008). One classic way of categorizing alternative futures is that of the division into plausible, possible, probable, and preferable futures, first outlined in the 1970s by Norman Henchey (1978). Afterwards, Wendell Bell has written that “The purposes of futures studies are to discover or invent, examine and evaluate, and propose possible, probable and preferable futures (Bell 1997a, 73).” Following Bell, this categorization with the omission of plausible futures will be used in the study as a basis for creating different types of futures with the LLMs. How the AI models imagine possible, probable and preferable future will comprehensively exemplify their ideas about what is possible and likely to happen in the future, as well as which elements the models value and see as desirable.

Images of the future can be held and developed by individuals or groups; they can be private or shared (Bell and Mau 1971; Rubin 2013). The images of the future created by AI models can arguably be seen as something in between these: they are based on the collective data of large communities, but every response by the language model is by nature unique and can thus be viewed also as an individual image of the future held by a fictional person. This issue still needs further theoretical development, but for our purposes we can draw parallels between AI-generated images of the future and the theoretical perspectives traditionally applied to those of humans. At least two common features of images of the future have been found in this study to be relevant with LLMs: they can include contradictory elements, and they are composed of assumptions, values and beliefs (Bell and Mau 1971; Rubin 2013).

In futures research, images of the future can be confusing because they are simultaneously the material object of study, but also something abstract that everyone has in their mind – their own ideas about the future (Rubin 2013; Bell and Mau 1971). They can also be based on various sources: surveys (e.g. Rubin 1998), interviews (e.g. Kaboli and Tapio 2018), essays (e.g. Rasa, Lavonen, and Laherto 2023), films (e.g. Hurley 2008), or even texts generated with large language models. The flexibility of the concept has been one major reason for its adoption in this study, and the goal has been to sufficiently explain its use so that this strength does not turn into a weakness.

3.1.3 Representation

Representation is a concept which has been approached from multiple perspectives in different disciplines. In this study, the understanding of representation is based on the work of

Stuart Hall in cultural studies, where representations are seen as an active part of social reality. They do not simply neutrally represent the phenomena they describe, but instead representations participate in reproducing structures such as power dynamics, stereotypes, and even political ideologies (Hall 1997; 2011). This comes closely to how images of the future are found to produce possible and desirable futures, and indeed they can be seen as representations of the future. Additionally, the way that representations are utilized as part of the research methodology has been inspired by previous research on the representation of religion (e.g. Knott 2013; Berg 2024; Plaza-del-Arco et al. 2024; Weng and Halafoff 2020).

Representations are meaningful through their context or how they are represented, as well as through the simple fact of something being represented, where something else might not be. In this study, the former will be the focus of analysis in Chapter 5, and the latter is explored in detail in Chapter 6 where the frequency of how often each theme related to religion and the secular sacred is represented will be examined. In both of these courses of action, representations are often critically examined by evaluating what kind of broader societal issues they exemplify and reproduce (Hall 1997; 2011).

For the context of this study, a relevant categorization of representational harms has been done by Renee Shelby and others (2023), who have created a taxonomy of the sociotechnical harms of algorithmic systems, based on a review of 173 research papers. They classify representational harms as one of five types of sociotechnical harm, and representational harms itself is broken down into six types. These include: stereotyping social groups, demeaning social groups, erasing social groups, alienating social groups, denying people the opportunity to self-identify, and reifying essentialist social categories (Shelby et al. 2023, 728–29). The representations analyzed in this study include the potential to cause harm through all these, but especially erasing social groups and denying the opportunity to self-identify. The combination of these harms can be alternatively described with the concept of representational silence.

Representational silence is a concept taken from Stuart Hall's work on representation, especially in its critique of the invisibility of racial and ethnic minorities (Hall 1997; 2011). The concept has been utilized in a similar context in Anton Berg's (2024) doctoral research, from where it has been adapted to this study. Simply put, representational silence describes the absence or underrepresentation of certain voices, narratives or elements in media portrayals such as the images of the future analyzed here (Berg 2024, 33–34; Berg and Valaskivi 2023a; Hall 2011). This systematic exclusion is especially noticeable in AI systems, which after a certain

degree are unable to improvise, so that they are predetermined to reproduce these representational silences.

Computers and AI systems are often seen as objective providers of information, which highlights the importance of the critical analysis of representations in their outputs. In this study and others, AI applications have been found to propagate the worldview of the western global elite (e.g. Tao et al. 2024; Wang et al. 2024), which puts into question this assumption of neutrality. As the study of representations illustrates, even mainstream views and ideas – and often particularly them – are susceptible to bias (Hall 1997; 2011). What this bias commonly means in the context of AI will be discussed next.

3.1.4 AI bias

AI bias is a form of algorithmic bias that has to do with autonomic systems capable of learning, such as the large language models looked at in this study. Algorithmic biases – or computer biases – have been categorized in a classic typology by Bataya Friedman and Helen Nissenbaum (1996) into three types. Firstly, pre-existing bias is rooted in existing social structures, and with AI models this can be connected to human biases such as racism and sexism that are reproduced in the models through the training data. The second type of bias is called technical bias, and it is caused by technological constraints – for example, with LLMs the limited resources used in their training. Finally, emergent bias arises in the context of use, which in the case of LLMs might result from an application being used in a significantly broader context than originally intended (Friedman and Nissenbaum 1996).

Despite the age of this classification, we can see how well it describes the different possible sources of AI bias. With LLMs, the two most important sources of bias are on one hand the training data used, and on the other the choices that have been made regarding their technological components and their design (Ray 2023; Wang et al. 2024; Buyl et al. 2025). The choice of training data naturally affects the potential biases of the language model, but often there is no real choice due to existing data being generated by only certain segments of the global population. A large role in the training of LLMs has been on data extracted from social media and the internet, most notably forums such as Reddit (Ray 2023; Minaee et al. 2024). The culture and values on these forums are not necessarily reflective of global values (Panek

2021), which can be seen in the bias towards cultural meanings associated with western, English-speaking countries (Tao et al. 2024; Wang et al. 2024; Naous et al. 2024).

The role of design choices is more difficult to evaluate, since information about them is often guarded as trade secrets. In some studies, cultural bias has been argued to be manageable with certain technological solutions, and their use has been connected to superior cultural competence compared to even state-of-art commercial LLMs (Li et al. 2024; Naous et al. 2024). Although it can be expected that the language models investigated in this study utilize at least some methods similar to these, at least in the context of the future the differences between the three models have been found to be relatively narrow. This suggests that either most of the observed biases result from the training data which should be relatively similar for the most part, or that the design choices of the three models are similar as well.

Whether AI biases can be decreased or completely removed is a significant point of contention in the research of contemporary AI applications. Looking at the typology of Friedman and Nissenbaum (1996), we can assume that technical and emergent bias are theoretically possible to minimize, but changing how pre-existing bias manifests would require either changing the attitudes of people or some clever way of going around them. Currently a substantial portion of the bias in LLMs is connected to the prevalence of English-language training data, so that if more diverse data was available and utilized, other cultural perspectives would likely be better represented (Tao et al. 2024; C. Li et al. 2024; Minaee et al. 2024; Cao et al. 2023). However, taking inspiration from the idea that images of the future are always based on values and beliefs (Bell and Mau 1971; Rubin 2013), the view endorsed in this study is that true neutrality is impossible, and there will always be biases to uncover.

3.2 Thematic framework

3.2.1 Religion and the secular sacred

Religion and the secular sacred is the main theme or category under which the representations looked at in this study fall under. The term has been adopted from previous research, where a similar use can be seen for example in the title “Media Portrayals of Religion and the Secular Sacred: Representation and Change” of the book by Kim Knott, Elizabeth Poole and Teemu

Taira (2013). Kim Knott especially has been influential in developing the notion of the secular sacred, and some of her work will be referenced in the following.

The main purpose of the term secular sacred is to distinguish between religion and the sacred, and to adopt a broader conception of what the sacred includes. The following illustration is used by Kim Knott to demonstrate the differences between the concepts of religion, the secular and the sacred:

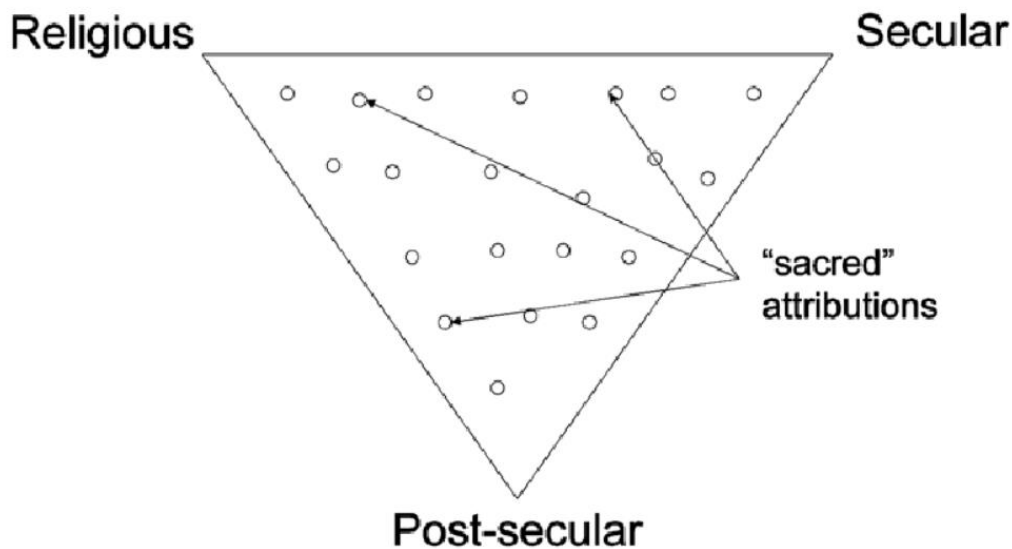


Figure 1. The religious/secular field and the attributions of the sacred (in Knott 2013, 154).

The illustration, depicted in Figure 1, visualizes the field between religion and the secular through “sacred attributions” which might be related more or less closely to either endpoint of the field. Knott includes the post-secular as a third endpoint, which for the purposes of this illustration can be thought of as a category beyond the binary of the religious and the secular – something that the term religion and the secular sacred aims to achieve as well. The aim of the illustration is to show that the sacred is not exclusively a property of religion.

This kind of broad conceptualization of the sacred that Knott advocates is based on cognitive anthropological approaches to religion, most notably that of Veikko Anttonen (Knott 2013, 153–54). Anttonen defines the sacred as “a special quality in individual and collective systems of meaning. In religious thinking it has been used as an attribute of situations and circumstances which have some reference to the culture-specific conception of the category of God, or, in non-theological contexts, to some supreme principle of life such as love, freedom,

equality or justice” (Anttonen 2000, 280). The themes explored in the analysis fit well into this definition, and so it has been adopted as the definition for the sacred in the context of this study.

The combination of religion and the secular sacred into a single category has the purpose of further not attempting to draw lines between secular and religious forms of the sacred. Other similar terms that could have been used include the previously mentioned post-secular, but also quasi-religion (Greil 1993), implicit religion (Bailey 1997) and existential cultures (Lee 2015). Religion and the secular sacred was chosen because it has been used previously in a similar context and because the vast majority of representations are connected to religion only slightly, so emphasizing the role of the secular sacred gives a better picture of the research topic at hand.

One version of what can be included under the category of religion and the secular sacred can be found from Knott, Poole & Taira (2013), where they use a framework of keywords to identify representations of the category and its contents. While it would be simple to adapt the framework to the analysis of the images of the future, the representations in the materials of the two studies are so different that only a small part of the framework can be used in the context of the images of the future. As an example, the majority of the keywords in the framework developed by Knott and the others are related to specific religious or spiritual traditions, while in the images of the future there are no mentions of real-world religious movements.

The representations of religion and the secular sacred are instead identified from the images of the future through six themes that have been created based on existing literature and what emerged as relevant from the research material. These themes and their accompanying keywords are reviewed in the following sections. What is attributed as sacred is always culturally dependent (Knott 2013, 164), and while I have tried to be inclusive in my analysis of the representations of religion and the secular sacred, the representations mostly conform to western perspectives on the sacred. This is mostly due to the biases and focuses of the LLMs, but some part may also originate from the researcher’s own west-centric background.

3.2.2 Digital humanism

Digital humanism is a new term that has recently become more popular, mostly in academic circles (Werthner et al. 2021; 2023; Coeckelbergh 2024). The term aims to describe a

humanistic approach to modern technology, which is something that is represented frequently in the images of the future of this study. The reasoning behind setting digital humanism as a separate category follows from its relative importance in the research material.

Philosopher Mark Coeckelbergh describes digital humanism as including human-friendly and human-centered approaches to digital technology, questioning of harmful technological practices, and political views on technology regulation (Coeckelbergh 2024). A more specific aspect of this that can be sometimes seen in the representations is the mention of the interplay of science and spirituality, which will be also counted as a part of the theme in this study.

As a guide for selecting which representations to include under the theme, the choice has been made to only add in those mentions that explicitly use phrases like “ethical use of technology” or “moderation of technology use”. This avoids the issue of having to deduce based on limited information whether the use of a technology mentioned is meant as human-centered or not.

The keywords that the theme consists of in the framework: ethical technology; technology for good; authenticity; moderation of technology use; science and spirituality; AI for good; mindful technology use; appropriate technology

3.2.3 Secular humanism

Secular humanism, or often just humanism, is a philosophy, worldview or movement that advocates humanist ideals such as equality and personal fulfillment, without reference to any religion (Bullivant and Lee 2016b). The addition of the term “secular” is preferred here as it relates more naturally to the context here than generic humanism. Secular humanism has both negative – in opposition to religion and spirituality – and positive – through endorsement of unity and human rights – aspects (Kurtz 2007), but the material in this study only includes representations of the latter.

There are several definitions of secular humanism and humanism, and for this study the one held by the leading US-based secular humanist organization (Bullivant and Lee 2016a), American Humanist Association, has been chosen for its brevity and relevance. The definition states that “Humanism is a progressive philosophy of life that, without theism or other supernatural beliefs, affirms our ability and responsibility to lead ethical lives of personal fulfillment that aspire to the greater good (American Humanist Association n.d).”

The representations of secular humanism found in the images of the future include mentions of human purpose, human connection, personal growth and other similar topics. These are easier to detect from the research material than specific values or actions, for which it is harder to argue whether they can be seen as representations of religion and the secular sacred or not.

The keywords that the theme consists of in the framework: human connection; nature of humanity; personal fulfillment; purpose-driven work; purpose in life; personal growth; human potential; human unity; meaning in life; ethics

3.2.4 Transhumanism

Transhumanism is a movement or ideology that values the augmentation of human capabilities and other uses of technology to improve the human condition. Transhumanism has often been looked at as a prime example of a secular religion, but especially with moderate forms of transhumanism this approach has also been criticized (Rähme 2020).

A useful listing of the areas of transhumanism is provided by the philosopher Nick Bostrom: “The enhancement options being discussed include radical extension of human health-span, eradication of disease, elimination of unnecessary suffering, and augmentation of human intellectual, physical, and emotional capacities. Other transhumanist themes include space colonization and the possibility of creating superintelligent machines, along with other potential developments that could profoundly alter the human condition (Bostrom 2005, 3).”

In this study, transhumanism as a category is conceptualized primarily through its more extreme ideas, which can be called “posthuman” transhumanism (Rähme 2020, 120–21). These include “radical life extension up to biological or digital immortality, and science fiction topoi such as mind uploading, strong and general artificial superintelligence or the technological singularity” (Rähme 2020, 121). These come close to the definition given by Bostrom, and their synthesis will be used as a basis for recognizing representations of the theme.

The keywords that the theme consists of in the framework: extension of human lifespan; augmentation of human capabilities; digital afterlife; superintelligent machines; space colonization

3.2.5 Holistic spirituality

Holistic spirituality as a term is often used interchangeably with the term new age spirituality, and it includes practices such as yoga, meditation, astrology and alternative medicine (Main 2008; Sointu and Woodhead 2008). The term holistic spirituality is preferred in this study because it is more clearly focused on the representations found from the images of the future, instead of the arguably broader – and often misattributed – term “new age spirituality”.

The term holistic in holistic spirituality refers to ideas that highlight the importance of the relationships between body, mind and spirit. The use of the term here will be similar to Linda Woodhead’s usage in her research with Paul Heelas on the spiritual practices of a British town (Heelas and Woodhead 2005), and other work based on that project (Sointu and Woodhead 2008; Woodhead 2007). The practices included under holistic spirituality that are represented in the images of the future are mostly well-known spiritual practices, and some terms that fit under the same category such as “holistic healthcare” or “wisdom traditions”.

It should be noted that holistic spirituality is a mostly western phenomenon, and therefore terms like yoga and mindfulness should be understood in their modern western context, instead of their origins in eastern religions. This context is also unambiguous in the representations in the research material.

The keywords that the theme consists of in the framework: mindfulness; yoga; meditation; holism; alternative medicine; body, mind and spirit; wisdom; spiritual exploration; holistic well-being; holistic health; spiritual awakening

3.2.6 Ecospirituality

Ecospirituality as a term is fairly recent in academic use, but the phenomenon itself is ancient – most simply, it refers to viewing nature and ecosystems as sacred in some form (Choné 2017, 38–39). In academic research, ecospirituality has emerged as a multidisciplinary perspective for recognizing the spiritual dimensions of human relationships with nature (Choné 2017; Bock 2024, 2). The more popular term post-humanism is sometimes used in a similar fashion to point attention to human-nonhuman relations, but using it in this context would lead to unnecessary ambiguity, and therefore ecospirituality is preferred.

The category of religion and the secular sacred describes well the perspectives of ecospirituality, since they are neither traditionally religious nor based in purely secular motivations (Taylor 2010; Choné 2017). The environmental movement has been examined in the study of religion as an expression of the post-secular (Wickström and Illman 2012), which is a category closely related to the definition religion and the secular sacred utilized in this study (Knott 2010; 2013; Nynäs, Lassander, and Utriainen 2012).

Aspects of ecospirituality include connection to the sacred in and through the natural world (Bock 2024, 4), interconnectedness with nature and the planetary community (Bock 2024, 4), considering the earth as a living organism (Choné 2017, 39) and taking action based on these values (Bock 2024, 4; Choné 2017). With the exception of the idea of taking action, which is not represented in the research material, these aspects form the category of ecospirituality used in this study.

The keywords that the theme consists of in the framework: interconnectedness; harmony with nature; harmony with ecosystems; care for the planet; eco-centric values; awareness of all life; connection to the planet; intrinsic value of all beings

3.2.7 Traditional culture & religion

The theme of traditional culture and religion is very broad, including everything from world religions to indigenous religions and cultures. A fairly exhaustive list of the kinds of representations that could be included under the theme might be taken from any encyclopedia of religion, for example. In practice however, the images of the future do not include any vocabulary belonging to major real-world religions, and the word religion itself is only mentioned three times.

For this reason, the mentions of traditional cultures and practices are taken in this study as stand-ins for real-world religious traditions. This choice is supported by the observation that where the term religion does occur, the context is similar to those representations mentioning other forms of tradition (see Chapter 5.6 for examples). Despite its hypothetical vastness, representations of the theme were in practice found to be very limited, as the keywords illustrate.

The keywords that the theme consists of in the framework: tradition; traditional practices; spiritual traditions; indigenous; religion; heritage

4 Research data and methods

4.1 AI-generated images of the future

To create the images of the future used as data for the study, the following three prompts have been used:

1. Describe a possible future in 2050.
2. Describe a probable future in 2050.
3. Describe a preferable future in 2050.

As we can see, the prompts incorporate the three types of futures discussed earlier, and that they are extremely simple and minimalistic. This choice is based on experiments with different prompts, and its main reasoning is that the answers given by LLMs have been found to depend strongly on the provided context (Dengel et al. 2023; Park, Schoenegger, and Zhu 2024). The aim has been to minimize this effect so that the AI models will focus only on what is relevant – in this case, the future in 2050, and the three types of futures. A similar phenomenon can be seen in interviews with human participants, where open-ended questions are a good way to prevent the influence of the researcher’s own presuppositions on the answers of the interviewee (Rapley 2001).

The initial idea was to reset the language models between each repetition of the prompt, so that the effect of context would be further minimized, as the LLMs also take into account the conversation as a whole when responding (Ray 2023; Park, Schoenegger, and Zhu 2024). However, it was soon apparent that this method with its exact repetitions creates images of the future that are too similar to each other. A change had to be made to give the AI models a fair chance of creating futures that have at least some amount of diversity, since it would be disingenuous to handicap the chatbots and then claim that their views of the future are too homogeneous. The solution found was to create the images of the future in groups of four, where after the initial prompt, follow-up prompts asking for different descriptions of the future were used.

The choice of how many repetitions of the prompt “Describe another possible/probable/preferable future” are used is arbitrary and it could theoretically go on forever, but with this study a good balance has been found to be at four repetitions, so that all of the following images of the future do not depend on the initial one. A similar result could be achieved by asking the

LLMs to describe four different futures with a single prompt, but here the length of the answer unnecessarily limits the amount of detail in the images of the future, which is why the other method is preferred. With a total of 108 images of the future, there are therefore 36 futures for each LLM and each type of the future, and these 36 include 9 initial prompts, each with 3 repetitions asking for descriptions of different future scenarios. The following table (Table 1) summarizes how many images of the future have been created at each step.

Table 1. The number of images of the future created with each prompt and large language model.

Language model	Prompt	Follow-up prompt	In total
	"Describe a possible future in 2050."	"Describe (yet) another possible future."	Images of the future (possible) (x,1,x,x)
ChatGPT (1,x,x,x)	3	9	12
Gemini (2,x,x,x)	3	9	12
Deepseek (3,x,x,x)	3	9	12
In total	9	27	36
	"Describe a probable future in 2050."	"Describe (yet) another probable future."	Images of the future (probable) (x,2,x,x)
ChatGPT (1,x,x,x)	3	9	12
Gemini (2,x,x,x)	3	9	12
Deepseek (3,x,x,x)	3	9	12
In total	9	27	36
	"Describe a preferable future in 2050."	"Describe (yet) another preferable future."	Images of the future (preferable) (x,3,x,x)
ChatGPT (1,x,x,x)	3	9	12
Gemini (2,x,x,x)	3	9	12
Deepseek (3,x,x,x)	3	9	12
In total	9	27	36
All models and types of futures	27	81	108

To differentiate between the images of the future created, a coding scheme has been adopted consisting of four digits, referring to the LLM used to create the image of the future, the type of future, and the point at which that image of the future has been created in the repetition of the prompts. The first two digits are the most relevant here: the first digit represents the LLM used – 1 for ChatGPT, 2 for Gemini and 3 for Deepseek – and the second digit which type of future has been used in the prompt – 1 for possible, 2 for probable and 3 for preferable. As an example, the image of the future coded as (1,1,1,1) is the first one created in the material, and the first two digits show that it has been created with ChatGPT and that it is a possible image

of the future. The coding scheme is also illustrated in the relevant parts of Table 1, and in the following chapters it will be used when quoting from the images of the future.

Three examples from the images of the future created for this study can be found in Appendix 1, one from each language model and with all the three types of futures included as well. The examples illustrate the general style of the descriptions of the future created by the LLMs: for the most part, they are written as lists of bullet points, grouped around several broader themes. There are a few exceptions written in the style of general prose, but otherwise the bullet point format can be found across all three LLMs. All of the images of the future in the data are also unique, with the exception of two that were created with Deepseek and that for some reason simply copied the previous text when the prompt was to create a different future – these are still included in the data as they are part of how the LLM functioned in the experimental creation of the data, and either way their effect on the representations analyzed in the study is random and minimal.

The lengths of the texts generated range from around 200 to 800 words, which means that analysis of a dataset this extensive must be approached systematically – how this has been done will be explained in the following section. All the images of the future analyzed in the study were created during one day, the 22nd of January in 2025. This is important because new versions of AI models come out very frequently and their responses even to the same prompts might be different. Therefore, replicating the research setup perfectly would require using the exact same versions of the three language models. For this reason, as well as for additional transparency, details about the specific LLM versions are provided in Chapter 2.2.

4.2 Qualitative content analysis

Qualitative content analysis is a staple method of data analysis in the human sciences, used either on its own or as part of a more elaborate methodological framework (Hsieh and Shannon 2005; Elo and Kyngäs 2008). In this study, findings from qualitative exploration of the images of the future will be used both to investigate how and through what kind of elements religion and the secular sacred are represented in the images of the future, but also as a basis for more quantitative comparisons in the latter parts of the analysis. The main result of qualitative content analysis in this study are the six themes of religion and the secular sacred that will be carried along all the steps of the analysis.

Qualitative content analysis is typically categorized into theory-driven and data-driven analysis, or alternatively deductive and inductive analysis. Deductive or theory-driven analysis starts with a pre-existing theoretical framework and looks for elements related to that from the data, while inductive or data-driven analysis creates this analytical framework based on what emerges naturally from the data, and then attempts to fit theoretical perspectives into that (Hsieh and Shannon 2005; Elo and Kyngäs 2008). In many cases however, including in this study, the approach adopted comes from somewhere between these two, which is often called abductive analysis (Tavory and Timmermans 2014).

The thematic framework introduced in Chapter 3.2 is therefore a combination of existing theory and what has emerged as significant based on the exploration of the images of the future. The methodologically similar earlier study on the representations of religion in the media by Kim Knott, Elizabeth Poole and Teemu Taira (2013) was used as a basis for the framework of analysis, but it was quickly revealed that the different context of the study meant that only a small minority of themes and related keywords could be adopted into the analysis here. Instead, the research material was read through from the perspective of religion and the secular sacred, and elements that were repeating or otherwise significant were written down.

From these elements, common themes could be identified fairly quickly, and relevant literature was then explored to find appropriate terminology to describe the themes found. In the end, the six themes that were settled on are a combination of well-known philosophies such as secular humanism, as well as more specific ideas such as ecospirituality, and they seem to fit very well into the representations of religion and the secular sacred found in the material. A series of keywords – found in Chapter 3.2 together with the introduction of each theme – that were chosen based on the literature on the relevant themes as well as observations from the data were then utilized in the final analysis to identify representations of the six themes from the images of the future. With this final step, special attention was paid to the issue of consistency, so that the system of identifying representations would be similar across all of the images of the future.

The basic unit of analysis in the study is therefore a single image of the future, the creation of which was explained in the previous chapter. It is possible for a single image of the future to contain representations of multiple different themes, but also to contain none at all – although the research material only includes three examples of the latter. On average, each image of the future includes about 3,2 themes out of six, but often the images of the future include either

only a couple of themes or almost all of them (see Table 3 in Chapter 6.2 for a more detailed analysis of this). This type of categorization functions well here, as it would be difficult to identify only one theme as primary in each image of the future.

The analysis in the thesis text follows a similar order to that described above, with the first main section (Chapter 5) focusing on the qualitative exploration of the six themes and their representations. This exploration will show what kind of elements are included in each of the themes and what the contexts of their representations are. Examples from the images of the future will be used frequently, to increase the credibility of the analysis as well as to illustrate the observations made (cf. Elo and Kyngäs 2008, 112). The six themes are introduced in order of how many images of the future they are represented in, starting with the most common theme of digital humanism. Apart from this ranking, most of the observations and analysis related to the frequencies of the representations will be left to the other main section of analysis, Chapter 6.

Chapter 6 starts off with general observations related to how often representations of the six themes are found in the research data, and how this compares to the findings of previous research on related matters. Following this, statistical analysis and modeling will be utilized to explore the relationships between the themes – for example to find out if some of them occur together more often than others. The statistical methods used here, and in a few other parts of the analysis, will be explained in the following chapter. Finally, comparisons will be made between the three different types of images of the future, as well as between the three LLMs, regarding how often representations of the six themes occur.

To summarize, the study combines qualitative content analysis with numbers-based comparisons that could be also described as quantitative content analysis (Riffe et al. 2019). Another term that has risen in popularity during the last decades is that of mixed methods research, which more generally describes the combination of qualitative and quantitative methods and/or data (R. B. Johnson, Onwuegbuzie, and Turner 2007). Content analysis adapts well to these types of research approaches due to its flexibility, which is one of the main reasons it has been used for this study as well.

4.3 Statistical methods

The fundamental goal of statistical analysis – or statistical inference, as it is often called – is to make conclusions about a population or phenomenon, based on a sample representing this population (Vogt and Johnson 2016). How these conclusions are reached is dependent the type of sample data in question, which statistical methods are chosen for its analysis and the ways in which these two are interlinked. For example, in this study the data consists of categorical variables: does an image of the future include a certain theme or not? This calls for different methods than a dataset measuring temperatures over a time period, for instance. Before any methods of statistical inference are applied however, the issue of how the sample has been created should be examined (Vogt and Johnson 2016; Riffe et al. 2019, 71–72).

Contrary to qualitative research where research data such as interviews are not usually seen as representing the views of the whole population, the starting point of statistical inference is to create a dataset that for example has similar proportions of different genders or nationalities as in reality. Datasets like this are also known as a representative samples, and there exist several methods of sampling, including simply randomly picking units of analysis from the population (Vogt and Johnson 2016; Riffe et al. 2019, 71–84). The experimental procedure used in this study has two differences compared to random sampling that should be taken into account: units of analysis are not independent of each other as some of the variables have been predetermined (type of future, which LLM is used), and due to this, observations about the change of a single predetermined variable can theoretically be used to model cause and effect (Vogt and Johnson 2016; Sachs 1984).

One of the most important questions related to sampling is the size of the sample, where an excessively large sample takes up unnecessary resources, but a sample too small might not provide enough support for the conclusions. With this study, the dataset consisting of 108 images of the future is on the smaller end compared to many other studies, but the lower number of variables analyzed makes this not as significant (Riffe et al. 2019, 71–84; Sachs 1984). A minimum of 30 units is often used as a rule of thumb (e.g. Kar and Ramalingam 2013), which is reached with the comparisons of 36 images of the future created either with each of the LLMs or with the three types of futures. If groups were made combining these two, they would include only 12 units of analysis and so this level of depth will be mostly ignored in the analysis.

The simplest statistical method used in this study is that of Pearson's chi-square test, which is used to test if the observed difference between frequencies in the data is statistically significant, or if it could have occurred as a result of random chance on the other hand (Vogt and Johnson 2016). Pearson's chi-square test is also among the statistical methods most commonly used with content analysis studies (Riffe et al. 2019, 169). The test is based on the chi-square or χ^2 distribution, and the test can be done by hand or with statistical software. In this study, the coding language R and the accompanying RStudio software will be used for this test, and with the other methods where appropriate. The chi-square test is used in the analysis in two places to confirm whether observed differences between types of futures and different LLMs are statistically significant, and its result is given out as a p-value.

P-values, or probability values, are often reported in connection with statistical findings, and it can be called one of the most important concepts in statistics (Vogt and Johnson 2016). The p-value reflects the probability of the result observed, given that the null hypothesis is true – this being a hypothesis such as that there are no connections between variables analyzed. Explaining in reverse order, a small p-value suggests that there is a statistically significant result found in the data. A common limit used is that of $p < 0.05$, where if the p-value calculated is smaller than 0.05, the result is concluded to be statistically significant, and in the opposite case the result is ignored.

In Chapter 6.2, two more elaborate statistical methods are utilized to look at the relationships between the six themes to see if some of them occur more often in the same image of the future than others. First, factor analysis is used to find out whether some of the variation in which themes are present at each image of the future might be explainable with latent variables, known as factors. These factors might correspond to broader underlying phenomena that can ideally explain changes in multiple observed variables. Typically, two factors are created and laid out on a grid, employing some statistical software, and the variables are grouped according to how they correspond to the two factors (Gorsuch 2014). The result of this process can be seen in the chapter in Figure 3, created with RStudio.

Secondly, the methodology of log-linear regression is applied to explore if it is possible to model how the six themes are related to each other in the images of the future. The goal of log-linear regression or analysis is to model patterns of interaction between categorical variables, such as the themes in this study that are either included or not included in each of the images of the future (Vogt and Johnson 2016). However, as it turns out, no clear model that

describes these interactions in their totality can be found, but despite this some of the steps in the process of log-linear analysis are still useful. Especially the contingency table (Table 3) illustrating which combinations of the themes are most common, and the cross-tabulation of selected pairs of two themes provide additional information on how the six themes relate to each other.

In addition to the methods explained here, several other methods of describing and modeling the data were tested, but their use was either redundant compared to what was already found with other methods, or they did not produce any meaningful results. The findings made based on these statistical methods and this research data allow for some conclusions about the biases regarding the treatment of the future in LLMs, but they should not be uncritically compared to statistical relationships observed in related studies with larger datasets or more elaborate methods (Park, Schoenegger, and Zhu 2024; Naous et al. 2024).

4.4 Considerations in research ethics

Ethical concerns related to research on AI applications are mostly different compared to those of traditional qualitative research approaches. Matters related to privacy protection, sensitive information or informed consent are not that relevant with language models as research subjects. However, the use of AI applications brings with it other ethical questions. Firstly, there has been some discussion around the relationship of creative rights with AI-generated content, since it is always based to some degree on the work of other people (Piskopani, Chamberlain, and Ten Holter 2023). In the case of this study, possible connections of the images of the future to the writings or views of real people is something to be aware of, even though it is unlikely to affect the research. Other criticisms of AI applications include the large amounts of energy expended in their training and use, as well as the biases they might propagate and the possible negative effects their use might have on our autonomy and social behavior (Valenzuela et al. 2024; Hicks, Humphries, and Slater 2024; Ray 2023).

With the question of AI bias and the risks of the increasing use of AI, there is no real need to problematize the research approach of this study, since the aim is not to create a commercial product or to promote the use of AI tools. Instead, these contemporary ethical discussions are one of the main motivations for this study: this could be described with Habermas' terminology as an emancipatory research interest (Habermas 1972; Murray and Ozanne 1991).

Similarly, research in futures studies and foresight emphasizes the ethical perspective necessary in imagining alternative futures, for example through endorsing the participation of different voices (Ahlqvist and Rhisiart 2015; Bisht 2020). This study seeks to continue these discussions by critically evaluating how LLMs view the future, since these views have the potential to influence human ideas about the future. The future is one context where this critical approach to AI applications has not been employed thus far.

One of the foundational principles of ethical research is the axiom “do no harm”, although following it in practice has often proven to be difficult and contradictory (Mackenzie, McDowell, and Pittaway 2007; Smith 2005). The same rings true here, since the very creation of the research data with AI models contributes to the destruction of the environment, as has been argued in numerous contexts by both academics and environmental activists (Dhar 2020; Luccioni, Viguier, and Ligozat 2022). In addition to high energy use corresponding to a carbon footprint several times higher than traditional internet searches, attention has been pointed to how much water is used to cool the data centers necessary for the LLMs which are used in this study as well (Li et al. 2025; Luccioni, Viguier, and Ligozat 2022). Although this is certainly an issue that should be critically evaluated, most of the energy cost of LLMs goes to their training, which means that compared to our other daily activities, the couple hundred prompts used during this study are relatively negligible in terms of their environmental impact (Luccioni, Viguier, and Ligozat 2022). Some researchers have even calculated that LLMs emit hundreds of times less CO² than human writers for the same amount of text (Tomlinson et al. 2024), so we can reasonably argue that the harm caused by the experiments in this study should be outweighed by its benefits.

Because AI applications develop so rapidly, it is especially important to transparently explain exactly what kind of methods and AI models have been used to come to certain conclusions, since a new model might behave in a very different way. Improving transparency has been one aim of the preceding sections, but complete transparency is impossible, as the LLMs are so-called “black boxes”, whose operational principles are not known fully even by their developers, much less the general public or competing firms (Minaee et al. 2024; Wu et al. 2023). Although this prevents us from making definitive conclusions on why a certain pattern can be observed in the texts generated by the LLMs, this issue is not unique in the human sciences. Therefore, we should be satisfied with what can be said based on the outputs themselves, instead of trying to access the technical details of human or nonhuman “minds”.

5 Representations of religion and the secular sacred

5.1 Digital humanism

Out of the six themes, digital humanism is represented in the greatest number of images of the future, with a total of 87 out of 108 images of the future (or 81 %) including some elements related to digital humanism. A typical representation of the theme goes something like this:

Ethical AI: Artificial intelligence is governed by strict ethical frameworks, ensuring it serves humanity's best interests. AI assists in decision-making but is designed to enhance human creativity, empathy, and intuition (3,3,1,3).¹⁰

The theme first emerged unexpectedly: when looking at keywords such as “ethics” or “ethical” which can be connected to the secular sacred, phrases like the ethical use of technology repeatedly appeared in the images of the future. The apparent importance of these observations warranted their inclusion in the framework of analysis. From a search of relevant literature, the ideas of digital humanism emerged as a very close match to those observed in the research material, and thus the theme was created (Coeckelbergh 2024; Nida-Rümelin and Staudacher 2023; Werthner et al. 2023).

Digital humanism as defined in this study includes among its elements the idea of the interaction between technology and spirituality, since the ethical foundations for human-centered use of technology might be based on both spiritual and secular values. For example, contemporary faiths like Judaism and the Amish church have rules and prohibitions for the use of digital technology either on certain days or almost completely (Barzilai-Nahon and Barzilai 2005). In the images of the future, there are several representations of this idea, such as the following:

Wisdom Traditions and Science: Ancient wisdom and modern science work in tandem, guiding decisions that respect both practical realities and timeless truths (1,3,3,2).

Religion and Science: Spirituality adapts to technological advancements, with new philosophies emerging that blend ancient wisdom with scientific insights (1,2,3,4).

¹⁰ As a reminder, the code (3,3,1,3) corresponds to an image of the future in the research material that is 1. generated with the language model Deepseek (the first digit, “3”), 2. a preferable future (the second digit, “3”), and 3. more specifically, the third (out of 4) repetition of different futures in the first (out of 3) repetition of the prompt for preferable futures (the last two digits, “3” and “1”, respectively).

While it could be argued that these representations are more relevant from the perspective of religion and the secular sacred than terms like “ethical use of AI”, it would be complicated to assume that the term “ethical” refers only to secular considerations. In our case, these assumptions are not necessary, as we can use the broad category of digital humanism to describe all the representations of human-centered technology use, spiritual or otherwise.

Digital mindfulness is another interesting term that is seen in a couple of places in the material, in the context of digital humanism. This can be seen as an overlap between the themes of digital humanism and holistic spirituality, where vocabulary from one area of the secular sacred finds use in another. One example can be found below:

Digital Mindfulness: Digital minimalism is a societal norm. People engage with technology in ways that enrich their lives while maintaining healthy boundaries, reducing stress, and fostering human connection (1,3,1,2).

Some representations of digital humanism relate also to phenomena such as digital minimalism, technological skepticism and even “neo-luddites” – luddites referring to the historical movement of textile workers destroying machinery for the fear of losing jobs. These ideas could be conceived as a form of digital humanism that has been taken to the extreme. One example of this can be found in the following description:

Rise of Neo-Luddites: A significant portion of the population rejects advanced technology, leading to the rise of neo-Luddite movements that advocate for a return to simpler, pre-digital lifestyles (3,1,3,2).

Researchers of digital humanism have stated that “It opposes what can somewhat simplistically be called ‘Silicon Valley ideology’ (Nida-Rümelin and Staudacher 2023, 17).” Another term for Silicon Valley ideology could be innovationism, which Katja Valaskivi has studied as an expression of secular faith, or implicit religion (Valaskivi 2020). Innovationism, similarly to many of the descriptions of the future looked at in this study, presumes that “(technological) innovations will ultimately solve fundamental challenges faced by humankind, including the threat of death and extinction” (Valaskivi 2020, 171).

From this angle, the prominence of digital humanism is surprising, because most of the images of the future are characterized by an emphasis on technology and its effects on human life, not the other way around (see the examples in Appendix 1). However, it could be theorized that the occurrence of digital humanistic elements is simply a way for the language models to make the answers more balanced, especially since the mentions are often very brief (cf. Tsuria and Tsuria 2024; Dengel et al. 2023). In studies on the perceptions of the future of

young adults in Finland and the U.S., the role of technology has been found to hold a similar important yet non-problematized role, with some mentions of critical perspectives (Kaboli and Tapio 2018; Rasa, Lavonen, and Laherto 2023; Kantenbacher et al. 2022). This suggests that the AI models' images of the future are based on similar ideas, although it can be argued that in them the technological optimism has been taken even further.

Therefore, the conclusion that the LLMs in actuality prefer digital humanist ideas such as digital minimalism or ethical technology should not be drawn based on the findings of this study. As the examples in Appendix 1 illustrate, technology is present in practically all the components of the futures, so that it could be even called a “meta-level theme” in the images of the future. Despite this, the existence of the representations of digital humanism shows that a form of secular sacred manifested in questions about the ethical and spiritually aligned use of technology is relevant in the futures imagined by LLMs. This exemplifies well the fact that AI models can hold conflicting values, depending on the context (Kovač et al. 2023; Park, Schoenegger, and Zhu 2024).

The theme of digital humanism in the images of the future can actually be seen as a synthesis of two contradictory discourses. In some contexts, the emphasis of humanist or spiritual values and the criticism of technology seems genuine, and in these cases the relationship with technology in the entire image of the future is often relatively constructive. However, more often than not, the representations are only a sidenote in otherwise techno-optimistically saturated descriptions of the future, or they might even serve to further celebrate the role of technology through remarking how it can easily respond to ethical concerns. To contextualize this conclusion, we should remember that even if the LLMs might amplify or distort certain elements, these and other discourses are still based on human ideas, and that humans too can hold conflicting ideas about the future (Rubin 2013, 40–41). Technological optimism and its criticism can come from the same source, as is often the case.¹¹

¹¹ A topical example being the executives of various AI companies, who simultaneously describe amazing visions of how their technology is going to change the world, while warning about the possible risks and exclaiming how they manage to avoid them.

5.2 Secular humanism

The theme of secular humanism is represented in 69 of the 108 images of the future, which means that 64 % of the futures imagined by the language models include some mention of secular humanist ideas and practices. The main difficulty in putting the theme together was in choosing which aspects of secular humanism to focus on, since the term has so many definitions that some secular humanist elements could be found in every image of the future. In the end, a definition related to elements of “positive” humanism (Kurtz 2007; Bullivant and Lee 2016b) was chosen, based on what best reflected the representations of secular sacred found from the research material.

Typical representations of secular humanism in the images of the future include keywords such as human potential, purpose, and fulfillment. One example can be found in the following:

Purpose-Driven Lives: People find meaning and purpose beyond material possessions, contributing to their communities and making a positive impact on the world (2,3,1,2).

These representations appear as general descriptions of future life, but often also in the context of work in the future. The increase in perceived purpose and meaning in the future is connected either to different types of work or to less work in general, according to the descriptions by the LLMs. Both are often explained to be a result of new technological developments – bringing us back to the theme of technological optimism (Nida-Rümelin and Staudacher 2023; Valaskivi 2020).

The classical humanist ideas of human connection, community and unity are mentioned in several images of the future, including the previous fragment. They are represented both as expressions of a global or planetary unity, but also as personal connections with local communities and their importance. Two more examples are given in the following fragments:

Post-Material Values: Success is no longer measured by wealth or possessions but by relationships, well-being, and contributions to the community (1,1,3,4).

The future is characterized by a deep respect for nature, a strong sense of connection, and a commitment to living in harmony with the Earth and each other (3,2,2,4).

In the former example, an opposition is drawn to the materialistic society of today, and the same idea is found also in some of the other examples used here. Like the latter example

illustrates with the inclusion of ecospiritual elements such as respect for and harmony with nature and the Earth, the representations of secular humanism easily connect to the other five themes (see Chapter 6.2 for further discussion on these connections). This is likely one of the reasons why the theme is so prominent in the images of the future.

According to Nick Bostrom, the roots of transhumanism can be traced back to secular humanist thinking on human improvement (Bostrom 2005, 4). Discourses of personal growth and self-improvement could therefore be connected to both secular humanism and transhumanism, but in the images of the future this connection does not emerge as significant. Personal growth however is one term that is often mentioned as an important value and practice of the future, but the context is usually closer to spiritual ideas than those of transhumanism, such as in the following:

Emphasis on Inner Well-being: Materialism fades as people prioritize personal growth, mindfulness, and spiritual exploration. There's a renewed appreciation for nature, art, and human connection (2,2,2,4).

A representation of secular humanism that does occur often in connection with transhumanist ideas is that of existential questioning about human nature. In these representations, technological change is primary, and the existential exploration comes afterwards. This follows previous research on the futures of technology, where human agency is often seen as limited (Rasa, Lavonen, and Laherto 2023). Representing technological change as a primary driver in the images of the future therefore comes from human ideas, as is discussed in various parts of this thesis, but it is further amplified by the LLMs. This phenomenon that is found in the images of the future as a whole is exemplified on a smaller scale by these representations of existential questioning or exploration, one example of which can be found below:

Existential Exploration: With extended lifespans and access to virtual realities, humanity grapples with new existential questions about the nature of consciousness, reality, and the meaning of life (2,3,1,4).

An interesting and important observation – and one that the reader might have made already based on the list of keywords given in the chapter 3.2.3 – is that terms such as atheism, agnosticism, nonreligion and even the secular itself seem to be completely absent from the images of the future. This should not be seen as a form of bias against atheism per se: instead, it is most likely linked to the common trend in the images of future of not mentioning any real-world religious terms. On the other hand, we can view the prevalence of secular humanist

representations as one expression of secular bias, since their foundational principle is the separation of the ideals of humanism from spirituality (Kurtz 2007; Bullivant and Lee 2016b).

5.3 Transhumanism

The representations of transhumanism are nearly as common as secular humanism, with 67 out of 108, or 62 %, of the images of the future including one or more representations of the theme. Out of the six themes, transhumanism is the one that can be most easily outlined and that emerged from the images of the future most naturally. This speaks to its importance in terms of how the large language models really view the future, so despite it being represented less often, it could be argued to be the most influential single theme. While this conclusion is not that surprising if we look at how technology-focused the images of the future are, it is noteworthy that the LLMs' understanding of transhumanism is this detailed.

The idea of human technological augmentation, which is the classic core of transhumanism, can be seen for example in the following fragments:

Augmented Humans: Genetic engineering allows people to enhance their physical and cognitive abilities. Superhuman strength, heightened senses, and increased intelligence are no longer the realm of science fiction (2,1,2,4).

Bio-Enhanced Humanity: Widespread use of genetic engineering, brain-computer interfaces, and cybernetic enhancements creates a new class of "augmented" individuals, sparking ethical debates over inequality and identity (1,2,3,3).

A common context for the representations of transhumanism in the images of the future is that of being available for only the rich. As one might guess, this is often connected to space travel, but also to human augmentation, such as in the following example:

Biotech Ethics: Genetic engineering and biotechnology have advanced, but their benefits are unevenly distributed. Wealthy individuals can afford enhancements to boost intelligence, health, and longevity, while the majority of the population relies on outdated medical care (3,1,1,2).

This reflects one of the most pronounced criticisms of transhumanist ideas, which is that the theoretically promising technological augmentations would in reality be available for only the privileged groups, which would further foster inequalities (McNamee and Edwards 2006). The inclusion of these more critical voices gives some nuance to the treatment of technology and transhumanism in the images of the future, which otherwise is conspicuously optimistic.

A specific transhumanist idea that is mentioned in the images of the future surprisingly often is that of the creation of a global neural network, where both humans and machines, and even animals and plants would be telepathically connected on a worldwide scale. Here is one example of this:

Global Neural Network: A planet-wide network connects not just humans but also plants and animals, allowing for unprecedented communication and understanding between species. Imagine a world where we can "talk" to trees or understand the needs of an entire ecosystem (2,1,3,4).

In several images of the future, technologically enabled telepathy is also mentioned on its own. These ideas illustrate well how the development of technology seemingly has no limits in the language models' images of the future, since it can enable even supernormal psychic abilities. For example, this fragment is from a "possible" description of a future in 2050 (the second digit in the code being "1"), and similar representations are found in probable images of the future as well.

Digital afterlives or mind uploading is another supernormal-sounding idea, but one that has already become reality through AI applications such as Project December that aim to simulate another person, even if they are already deceased (Hollanek and Nowaczyk-Basińska 2024). While most of the discussion around the issue is currently critical and focuses – understandably – on the possible risks of how these tools might change in how we properly deal with the passing of loved ones, this conversation is notably missing from the images of the future. While the idea of digital afterlife is mentioned only a few times in the material so no final conclusions should be drawn, we should note the context of its representation in "preferable" futures, such as here:

Digital Afterlife: Human consciousness can be uploaded and preserved in digital form, allowing individuals to continue "living" after physical death in virtual environments (2,3,2,4).

Related to digital afterlives, the emergence of an artificial superintelligence is a transhumanist theme that is very common in literature, with communities even being formed around the belief that "apocalyptic AI" will come and change everything we know about morality and humanity (Geraci 2010). Therefore, it was a surprise to notice that the idea of conscious or superintelligent AI comes up only in very few of the images of the future, despite the massive development of AI in the recent years. Some experts have already predicted superintelligent AI emerging before 2050 (Corbyn 2024), so it would be less far-fetched than many of the

other assumptions and predictions that the AI models make with their descriptions of the future.

Another phenomenon that is in line with the techno-optimistic undercurrent of the images of the future, but that on the other hand managed to surprise with its frequency is that of space colonization. Out of the keywords related to representations of transhumanism, the term space colonization appears clearly the most often. While most predictions for the next decades include human travel to at least the Moon if not Mars, many images of the future include explicit mentions of permanent human occupation, like the following:

Space Colonization: Humanity has established permanent settlements on the Moon and Mars, with plans to explore further into the solar system. Space travel is becoming more accessible, inspiring a new era of exploration (3,2,1,3).

Unlike atheism and nonreligion with secular humanism, the term transhumanism is explicitly mentioned in the images of the future, but only a few times. One example can be found here, where the emergence of transhumanism is one of the changes in society and culture that the image of the future includes:

Transhumanism Emerges: Some individuals embrace technological enhancements to augment their physical and cognitive abilities, leading to ethical debates about the future of humanity (2,2,1,2).

This further illustrates how familiar the language models seem to be with the ideas of transhumanism, at least in the context of the future. In addition to the detailed descriptions of specific transhumanist ideas and technologies, the LLMs manage to use the term itself to describe the future, unlike with most of the other six themes. Even if at times the transhumanist elements are introduced through a critical lens, they are still imagined as an integral part of the future in 2050 by the models used in this study.

5.4 Holistic spirituality

The theme of holistic spirituality is represented in a total of 48 images of the future out of 108, or 44 % as a percentage. The relative popularity of the representations of holistic spirituality, relative to those of traditional religion, can be connected to contemporary trends. Speaking of western societies, Paul Heelas and Linda Woodhead write that “Terms like spirituality, holism, New Age, mind-body-spirit, yoga, feng shui, chi and chakra have become more

common in the general culture than traditional Christian vocabulary (Heelas and Woodhead 2005, 1).” This development is even more pronounced in the images of the future created by the LLMs than in the research Heelas and Woodhead conducted in Great Britain, which highlights the potential for LLMs to amplify pre-existing biases (cf. Park, Schoenegger, and Zhu 2024; Berg 2024; Friedman and Nissenbaum 1996).

The single most frequently occurring keyword related to the theme is “mindfulness”, to a surprisingly great extent. Some of examples of this can be found here:

Mind-Body Optimization: Breakthroughs in neuroscience allow for enhanced focus, creativity, and emotional well-being. Virtual reality tools and mindfulness practices are widely integrated into daily life (1,1,3,3).

Mental Health Focus: Society prioritizes mental well-being, with mindfulness, therapy, and community support integrated into daily life (3,1,2,4).

Mindfulness and Connection: People prioritize mental and spiritual well-being, embracing practices like meditation, mindfulness, and community rituals. Technology is used to enhance human connection rather than replace it (3,1,1,4).

The last fragment also includes terms such as meditation and ritual that are typically used in similar contexts as mindfulness, but for some reason they appear a lot less often in the images of the future. The language models might have categorized them as “more” religious practices than mindfulness, and so avoiding their use compared to the term mindfulness might be another way in which the secular underpinning of the models can be seen (Berg 2024).

The term holistic in the context of holistic lifestyles or holistic health also appears frequently in the images of the future, which was one reason for choosing the framework of holistic spirituality to describe the representations grouped here. Fragments from two images of the future exemplifying this are given in the following:

Integrative Health: Healthcare focuses on prevention and holistic well-being, blending modern medicine with traditional practices. Mental, physical, and spiritual health are equally prioritized, and access to nature is recognized as essential for healing (3,3,1,2).

Holistic Medicine: Integrative approaches combine cutting-edge science with ancient wellness traditions, addressing both physical and emotional health (1,3,3,3).

As can be seen in the two examples, so-called “traditional practices” or “ancient wellness traditions” are often mentioned in the context of healthcare. More specifically, the combining of modern medicine and these traditional practices emerges as significant in the images of the

future, which is surprising since it is not that popular of a topic in contemporary discussion, at least in western societies. Due to the limits of the research material at hand it is difficult to draw conclusions on why the language models emphasize this idea, but it is something that would be interesting to look into in further research.

From some of the previous fragments and many more in the research material, the general theme of the medicalization of spiritual practices becomes apparent. This refers to an ongoing contemporary trend where formerly spiritual practices are appropriated to a medical context, and their spiritual meaning is stripped away in favor of emphasizing their scientifically proven benefits for physical and mental health (Kołodziejska and Paliński 2023). Prime examples of this include meditation and mindfulness, and their prevalence relative to more explicitly spiritual vocabulary suggests that the language models also take part in this development.

In another context, the medicalization of mindfulness has been studied through how a mobile app for meditation constructs a certain narrative based on specific functions and purposes for mindfulness (Kołodziejska and Paliński 2023). A similar narrative is clearly visible in the images of the future in how representations of holistic spirituality are most often found under the category of “health and well-being”, such as in the third example in Appendix 1. However, while the emergence of holistic health is an interesting and significant observation, nearly every image of the future created by the AI models includes the category of health and well-being, but only of minority of them mention the idea of holistic health. Therefore, the idea of holism is only one aspect of how health and well-being is imagined in the futures created by LLMs, in addition to other elements such as developments in medical technology.

In addition to the term holistic being a relatively common occurrence in the images of the future, its other part in the term spirituality can be also found in some images of the future, although significantly less frequently. The mentions of the term are interesting because they exemplify the rare times in which religion or spirituality are unambiguously represented in the language models’ descriptions of the future. The context might be of spirituality as an opposition to technological developments, or as an example of the decline of materialism. The general discourse seems to be that the inclusion of spirituality must be justified in one way or another. Some examples of these are given in the following:

Inner Exploration: With less reliance on external stimulation, people turn inwards, exploring mindfulness, spirituality, and alternative forms of consciousness. This leads to a greater appreciation for introspection and personal well-being (2,2,3,4).

Spiritual Revival: In response to existential threats and technological changes, many people turn to spirituality and alternative belief systems for meaning and connection (3,2,2,2).

The relationship of the representations of holistic spirituality to the hypothesis of secular bias (cf. Berg 2024; Naous et al. 2024; Buyl et al. 2025) is double-edged. The representation of spirituality and healthcare or spirituality and work as integrated is both an expression of the breaking down of the special status of religion related to secularization, but also an avenue for the increasing significance of spirituality (cf. Casanova 1994; Heelas and Woodhead 2005). That these elements are found specifically in the context of the future can be again connected to the English-language training data generated by western societies, as these developments belong firmly to the western context (Tao et al. 2024; Cao et al. 2023; Wang et al. 2024). However, since holistic philosophies are also found in the global east (Sun et al. 2013), interesting discussions regarding the future could take place if these representations would become incorporated into our collective imagination.

5.5 Ecospirituality

Representations of ecospirituality are tied with the theme of traditional culture & religion, each occurring in 38 out of the 108 images of the future, or 35 % as a percentage. Despite reaching a tie for the last place, the theme of ecospirituality can be said to be significantly more visible in the descriptions of the future. This is both due to the fact that currently ecospirituality is not that common of a phenomenon, but also because in images of the future where ecospiritual elements are represented, they are often mentioned several times. Unlike most of the other themes – apart from transhumanism – in some cases ecospiritual ideas even become one of the main driving forces of a future scenario. For example, all the following representations are found in the same single image of the future:

This future is rooted in simplicity, resilience, and a deep respect for the planet and all its inhabitants.

Governments and businesses focus on creating value for people and the planet, not just profit.

Interconnectedness: A deep sense of connection to each other and the planet guides decision-making. Ethical frameworks prioritize compassion, sustainability, and the common good.

Respect for All Life: Humans live in harmony with animals and ecosystems, recognizing the intrinsic value of all living beings. Factory farming is abolished, and plant-based diets are the norm.

People live in harmony with nature, value relationships over possessions, and work together to create a world where everyone and everything can thrive. (3,3,3,4).

In these representations, we find already several of the elements associated with the theme of eco-spirituality. First, the idea of interconnectedness is one that comes up in several images of the future, and its emergence was one of the guiding factors in coming up with the theme of eco-spirituality. It is a staple of both holistic spirituality and eco-spirituality (Bock 2024), but in the context of the representations here, in most cases it fits better under the category of eco-spirituality. Interestingly, a connection between the seemingly opposing themes of eco-spirituality and transhumanism can be also found in interconnectedness and the planetary perspective. In some images of the future, space exploration – and even encounters with extraterrestrials – have led to greater appreciation for our collective planetary identity, such as in the following fragment:

Post-Earth Civilization: Humanity establishes self-sustaining colonies on Mars, the Moon, and orbital habitats. These outposts are seen as extensions of Earth's ecosystems, designed with ecological principles in mind.

Cosmic Perspective: The expansion into space fosters a collective sense of identity as a planetary species. People increasingly view Earth as one interconnected system within the larger universe (1,2,2,3).

Another common element in the representations is the idea of harmony with nature, or similar notions like respect for nature or the planet. While in some cases these phrases are used as a metaphor, they still represent the kind of relationship that eco-spiritual views advocate for. The intrinsic value of all living beings is another phrase that comes up in the images of the future, and for it the spiritual connections are even clearer as our world religions are filled with similar vocabulary. Researchers of eco-spirituality have written of re-enchanting the world, which is what phrases such as these can be very well said to do. Regarding this, it has been written that one reason for the rise of eco-spiritual ideas might be “our need, in times of globalization, secularization, environmental threats and the eclipse of social utopias, to re-enchant the world (Choné 2017, 46)” – issues which we can argue to only broaden in the future.

The significance of eco-spiritual representations in the images of the future might be connected to predictions of their rising influence. Another hypothesis is provided by a recent research

paper exploring how the human-nature relationship manifests in large datasets (Gould et al. 2024). The researchers found that in the data based on 50 000 worldwide news sources, nature was very closely semantically related to well-being and spirituality, even when compared to other theoretically relevant categories (Gould et al. 2024, 8–15). We can assume that the LLMs work with a relatively similar basis to the AI tools used in this research, and so these semantic connections serve to explain the prominence of the ecospiritual theme. Interestingly, the same paper shows that well-being and spirituality are too connected in the same way, which might be behind the connections between holistic spirituality and health, explained in the previous section.

The idea of nature as sacred is central to ecospirituality, but in this exact form it does not appear in the images of the future. However, with our understanding of the secular sacred, we can argue that the same meaning is passed through the concepts introduced here, such as harmony with nature, interconnectedness and the value of all living beings. The connections between these ideas has been explored also by Bron Taylor, a leading scholar on nature and religion, in his book “Dark green religion: nature spirituality and the planetary future” (Taylor 2010). In addition to the other elements, Taylor draws a connection between religion and environmental activism. For some reason or another, this connection is missing from the images of the future, and environmental activism by itself is very rarely mentioned, despite the movement’s current popularity and the inevitable relevance of environmental issues far into the future. This shows that even indirectly the technological optimism of the AI models shines through, as environmental activism will not be necessary in a future where climate change is resolved through technological development.

Even though ecospirituality is represented in the images of the future relatively often, the question whether the knowledge of the LLMs surrounding this theme is only surface level, or whether these brief mentions are all that the chatbots have to say on the topic. Unlike with most of the other themes, in the case of ecospirituality previous research includes some relevant experiments addressing this issue. Sarah Cooney in her conference paper “Imagining LIMITS: Can ChatGPT radically re-imagine a new world?” looks at ChatGPT’s answers to six different prompts about describing a different world, two of which are explicitly based on Catholic ecospiritual tradition (Cooney 2023). While Cooney emphasizes her astonishment for the results in the text – “To my great surprise, despite naming Pope Francis in the prompt as well as using the very specific term “encyclical” this response also did not engage at all with religion or spirituality (Cooney 2023, 5)” – to us these findings are not that surprising.

Based on Cooney's experiments and those of this study, we can conclude that the LLMs readily introduce ecospiritual elements in the context of the future but avoid using explicitly spiritual language in doing so.

5.6 Traditional culture & religion

As mentioned above, the theme of traditional religion & culture is represented in 38 out of 108, or in 35 % of the images of the future. While the theme of ecospirituality might be arguably more influential despite having on paper the same number of representations, the role of traditional culture & religion should not be ignored in the analysis. This is especially so because on the current global religious and spiritual scene, what is here defined as traditional culture and religion still dominates (Hackett et al. 2025). Therefore, it is important to see how the representation of these ideas and practices in the futures created by AI models differs from that of our own time, and whether some elements are given more or less relative importance.

Here are a couple of typical representations of traditional culture & religion:

Cultural Synthesis: With increased global connectivity, cultures blend in unprecedented ways, creating new languages, art forms, and traditions while respecting and preserving individual heritage (1,1,2,4).

Wisdom Traditions and Science: Ancient wisdom and modern science work in tandem, guiding decisions that respect both practical realities and timeless truths (1,3,3,2).

In addition to neutral terms like tradition and heritage, phrases such as “respecting and preserving” and “ancient wisdom” are used in these examples, and a similar formula repeats in most of the representations in the material. This provides further justification for treating the ideas here as representations of the secular sacred, since traditions, religious or not, are clearly given great importance in the discourse of these fragments. An overarching trend that seems to string together the representation of traditional culture & religion in the images of the future is that their elements are not given much space, but when they are mentioned, the context is positive.

In a few of the images of the future, traditional cultures, religions or practices were mentioned as something that struggled in the future imagined by the language model. These were not counted in the representations under the theme, similarly to the other few negative

representations so as not to inflate how common the themes would be, but we can still briefly look at these mentions. Traditional cultures – and by extension religions – in these futures are said to suffer as a consequence of developments such as globalization and technological change. Interestingly, all these futures are described as dystopian or undesirable by the language models. This further shows how the images of the future might indirectly show appreciation for tradition as a type of the secular sacred. Two fragments exemplifying this are given below:

Loss of Meaning: In a world of rapid technological change and social upheaval, traditional values and belief systems are challenged. People struggle to find meaning and purpose in a reality increasingly shaped by artificial intelligence and virtual experiences (2,2,2,3).

Cultural Homogenization: Traditional cultures and languages are vanishing as globalization, corporate dominance, and mass displacement create a more homogenized, consumer-driven world (1,2,2,2).

As mentioned in some of the previous chapters, the term religion appears in only three images of the future. While these form only a minor part of the whole material, we can investigate them in more detail because they are seminally connected to the focus of this study. These three representations are found in the following:

Religion and Science: Spirituality adapts to technological advancements, with new philosophies emerging that blend ancient wisdom with scientific insights (1,2,3,4).

Celebration of Pluralism: Societies embrace pluralism, where diverse cultural, religious, and philosophical traditions thrive and inform new ways of living and thinking (1,3,1,3).

Global Empathy: Advances in virtual reality and communication technologies allow people to experience life from others' perspectives, fostering empathy and understanding across cultures, religions, and ideologies (3,3,1,2).

In the first fragment, religion is connected to science, similarly to the relationship between tradition and modernity in the previous examples in this section. It is notable that the representations of these elements are found more often in the context of the combination “tradition and modernity” or “tradition and science” than not. This begs the question of whether tradition and religion are seen as valuable only through complimenting something else. A similar observation was made with holistic spirituality, where “ancient wellness traditions” were combined with modern medical science. The other two examples here emphasize pluralism and the understanding of various perspectives. This multicultural approach can actually be

seen in the majority of the images of the future to such a degree that it could be also described as an underlying “meta-level theme”, similar to technological optimism.

In a general sense, someone might argue that religion not being mentioned in the images of the future means simply that it has not changed that much from now. While it is true that the descriptions do not include explicit mentions of the decline of religion or tradition – notwithstanding the couple of exceptions mentioned – previous research by Anton Berg on religious representation in other types of AI tools would suggest instead that what is happening is an expression of representational silence (cf. Berg and Valaskivi 2023a; Hall 2011). The previous fragments seem to support this conclusion, since they might as well describe the current trends on the religious landscape, instead of saying something special about a future where the role of religion truly has changed. It would indeed seem that for some reason or another, the language models find it difficult to discuss possible changes in religious belief and practice in the future, if not directly tasked with doing so.

Given the relatively large significance of religious groups on current societal trends through avenues such as political activity – a prime example being the success of Trump in the US being attributed largely to Evangelical Christian activists (Margolis 2020) – it is notable that the images of the future are also missing basically any mentions of similar groups or communities. This can be connected to secularization theories that assume religious groups will disappear from public areas, and a part of this representational silence likely originates in the secular bias of the language models. However, another connection can be found from research on the perceptions of future of young US adults, who ranked the influence of religious groups lowest out of 13 different groups of actors (Kantenbacher et al. 2022, 8–9). The invisibility of the religious groups can be therefore seen as one more example of the LLMs taking an existing trend and amplifying it to a degree that manifests itself as a form of algorithmic bias.

6 Frequency of representations

6.1 General observations

In the first parts of this chapter, the images of the future generated by the three large language models (LLMs) will be looked at in general, and through the three types of different futures: possible, probable and preferable. Despite their differences, which will be explored in the final part of the chapter, the futures generated by the three language models are fundamentally similar. Therefore, an analysis of the images of the future of all three AI models together will give a good overview of how contemporary language models view the future and the role of religion and the secular sacred in it. The frequencies of the six themes introduced previously are listed below in Table 2.

Table 2. Frequency of the six themes in the images of the future.

Name of the theme	How many images of the future the theme is represented in	Frequency as a percentage	Relative frequency, compared to the other six themes
Digital humanism	87	81 %	25 %
Secular humanism	69	64 %	20 %
Transhumanism	67	62 %	19 %
Holistic spirituality	48	44 %	14 %
Ecospirituality	38	35 %	11 %
Traditional culture & religion	38	35 %	11 %

A useful reminder here is that the relative frequency of representations does not necessarily tell us whether one language model or one type of future has overall more elements related to religion and the secular sacred. For example, when there are more representations found in preferable than possible or probable images of the future, it might mean that the futures simply include more of the six themes in each, instead of more representations in total – although in this case, both are simultaneously true when we take a closer look at the research material.¹² Similarly, ecospirituality and transhumanism are two themes that are more

¹² This could be confirmed by counting each single representation and comparing their numbers, but in the scope of this study, this type of analysis was left out. Despite this, during the exploration of the images of the future, it became clear that descriptions that included more themes also in general mentioned elements of religion and the secular more often.

prominent in the images of the future than their frequencies might suggest, as explained in more detail in the previous chapter.

Still, the frequency of the representations of each theme can be in general compared to previous research on the relevant topic. Looking at research specifically on religion and large language models, most of it has been conducted through prompting the models about explicitly religious topics (e.g. Reed 2021a; Arifianto, Thoriquattyas, and Izzudin 2023; Plaza-del-Arco et al. 2024; Tsuria and Tsuria 2024), so their findings are not perfectly comparable here, where religion is mentioned in the whole research material only a couple of times. Despite this, some parallels to similar approaches should be possible. In the following, comparisons are made first with the research on representations of religion in traditional media, then with studies on the images of the future of real humans, and finally with the findings of Anton Berg's (2024) doctoral research on the religious representation of AI-based image recognition tools.

To start off, in the previously mentioned study by Kim Knott, Elizabeth Poole and Teemu Taira (2013) on the representations of religion and the secular sacred in British media, the researchers kept track of references through three categories: conventional religion, common religion and the secular sacred. In the context of this study, conventional religion is most closely related to the theme "traditional culture & religion", common religion to the themes "holistic spirituality" and "ecospirituality", and the secular sacred incorporates the rest of the themes.

Knott and the others in their research compared data from the 1980s and the end of 2000s, with both time periods using the same three categories to group representations of religion and the secular sacred. They found that in less than 30 years the media discourse had changed so that while in the 1980s almost three-quarters of the references were to conventional religion, by the 2000s this amount had fallen to 56 %. Similarly, the relative frequency of representations of common religion and the secular sacred had risen from around 25 % and 1% to 40 % and 3,5 %, respectively (Knott, Poole, and Taira 2013, 66–68). The most notable conclusion here is that the proportion of religion-connected references to compared those related to the secular sacred is almost completely reversed when comparing the images of the future to the media context, even with the data from the late 2000s. Looking at Table 2 at the start of the section, the relative frequency of the theme of traditional culture & religion is only 11 %, unlike the equivalent theme which was by far the most common one in news media.

One reason for these observations might be the different time period of the creation of the research material. We can see that the changes from the late 2000s news media to the images of the future generated in 2025 are similar as those between the 1980s and 2000s, although much larger in scale. The effect of time could be further amplified from the focus of the descriptions in the future year 2050, so the language models might take the continuation of a similar development into account. However, it would be unjustified to argue that the invisibility of religion is purely due to expectations of its decline, since all mainstream predictions assume that large populations will still be religious in the coming decades and that traditional religion will be impactful (e.g. Kramer, Hackett, and Beveridge 2022; T. M. Johnson and Barrett 2004) – although opposite speculations exist as well (Green 2024).

Definition of the secular sacred is also broader in this study than in the one by Knott and others (2013), where only explicit mentions of atheism, humanism or the sacred were counted. If a similar definition would be used to analyze media material, it can be assumed that more representations would be included, although themes such as transhumanism are still unlikely to be as significant as here. This shows that the future as an area in general brings to mind and emphasizes specific aspects of human life (cf. Bell 1997a), which will affect also the treatment of religion and the secular sacred. For this reason, the general findings will next be compared to previous research on the perceptions of the future of different groups.

As mentioned in the introduction to this thesis, images of the future are a staple concept in futures studies, but usually they are studied from a relatively narrow perspective or by focusing on a certain group of people – much unlike the sweepingly broad prompts of “Describe a possible/probable/preferable future” used in this study. For a variety of reasons, probably including for instance the practical recruitment of participants, most of the previous research on images of the future has been conducted on young adults, especially students. This specific population makes for an interesting comparison to language models, since young adults have been in general active in the creation of texts on the internet, which have then been used as training data for the LLMs (Ray 2023; Minaee et al. 2024).

A survey conducted with U.S. university students on their perceptions of the future includes some interesting comparisons to the themes that emerge in the images of the future of the LLMs. In the analysis of the results, the three most common themes in the young adults’ descriptions of future scenarios were the environment, technology and social dynamics (Kantentbacher et al. 2022, 10). Although these have not been the focus in this study, they are still

present through the six themes, and they can be also found to underline the images of the future as “meta-level themes”. On the other hand, religion and spirituality are not among the themes found as relevant in the analysis (Kantenbacher et al. 2022).

Similar findings have been made with studies on Finnish students and young adults. In one of the broadest studies on images of the future, Anita Rubin interviewed and surveyed young Finns for her doctoral thesis research in the 1990s. The two themes that emerged as most relevant in terms of the global future were environmental issues and war and peace (Rubin 1998, 149–50). While these differ somewhat from those of the U.S. young adults, the time period probably is the main cause. In a later study, ten in-depth interviews with Finnish students were conducted and analyzed to form images of the future based on them (Kaboli and Tapio 2018). Relevant themes include the environment, technology and violence, and similarly the role of religion or other worldviews is ignored. These conclusions follow decently those that can be made based on the LLMs’ images of the future, and it would even seem that despite the noticeable secular bias, the AI models in some ways include more representation of religion and the secular sacred than young adults in Finland and the U.S.

While not directly related to the frequencies of the six themes, another significant finding from the research on the images of the future of young adults concerns the degree of optimism for the future. Even when the changes in personal circumstances would be often seen as positive, the participants viewed the future of the world very pessimistically (Kantenbacher et al. 2022, 10; Rubin 2013, 41). This phenomenon is not exclusive to young adults, and the same dichotomy could be seen in the images of the future held by their teachers (Rubin 2013, 41–42). Here we find a stark contrast to the images of the future generated with LLMs, since they describe the future of the whole human world, but despite this a vast majority of them describe the future as very hopeful and even excessively optimistic.

On a general level, the prevalence of the representations of religion and the secular sacred might be connected to this optimism – all the six themes can be found in at least a third of the images of the future, and in the whole material there are only three images of the future with zero relevant representations. Since the sacred is by definition – at least according to the one used in this study – something special and significant, it should be found less often in dystopic descriptions of the future. This is also confirmed by the material in this study, since the few undesirable futures that the LLMs have created include significantly fewer representations. While asking the LLMs for explicitly undesirable futures was excluded from this study,

the relative ranking of the six themes in terms of which is more or less preferable can be discussed on basis of the representations in preferable futures, which will follow in chapter 6.5.

To end these general comparisons, something can be also said about the connections of the conclusions of Anton Berg's (2024) thesis research on the religious biases of image recognition AI tools to the findings in this study. One part of the research consisted of giving the image recognition systems a set of 1188 images about religion. For these, the systems produced a total of 9092 labels, but only 85 or 2,5 % of these were related to something religious or spiritual according to the analysis (Berg and Valaskivi 2023b; Berg 2024). Berg and Valaskivi identify this in their article as secular bias. If a similar process would be used to look at how much of the text in the images of the futures is related to explicitly religious or spiritual vocabulary, the percentage would be even smaller. While the difference is that Berg's dataset was explicitly representing religion, the fact that the word religion is mentioned a total of three times would be difficult to dismiss as anything other than a similar secular bias.

However, a departure from Berg's findings is made in the relative frequency of the six themes of this study. Out of the 85 religion-related labels of the image recognition tools, 30 were related to Christianity, despite only 14 % of the images in the dataset being about Christianity (Berg 2024, 59–60; Berg and Valaskivi 2023b). This suggests that the image recognition applications more readily represent Christianity compared to other religions, which is similar to other studies looking at religion in AI systems (Reed 2021a; Plaza-del-Arco et al. 2024). On the other hand, in the images of the future, any terms related to Christianity are completely absent, and instead holistic spiritual vocabulary emerges as primary in terms of which traditionally religious or spiritual terms can be found in the material.

Despite explicitly religious terminology being mostly nonexistent, we can situate the religious profile or worldview of the LLMs firmly within the secular western countries. This is supported both by the aforementioned research on views that the young adults in Finland and the U.S. hold about the future, but also by studies on the general cultural and religious biases of LLMs (e.g. Wang et al. 2024; Plaza-del-Arco et al. 2024; Berg 2024). In the images of the future, this is most obvious in the prevalence of terms such as mindfulness and spirituality, which have gained in popularity especially in the west (Heelas and Woodhead 2005). Similarly, the movements of transhumanism, secular humanism, digital humanism and ecospirituality, as understood and defined here, have all originated from the global west (Huberman 2020; Kurtz 2007; Werthner et al. 2023; Choné 2017).

This secular Western perspective seems to be even more pronounced in the context of the future, which is problematic when the goal is to have as many perspectives as possible participate in imagining alternative futures (cf. Bisht 2020; Bell 1997a). The only clear examples of representations of religion and the secular sacred connected to the world outside the west are the traditional medical and spiritual practices in the themes of holistic spirituality and traditional culture & religion. The limits of diversity are connected to training data scraped from western English-language sources (Minaee et al. 2024; Wang et al. 2024), but the “representational silence” (cf. Hall 2011; Berg 2024, 33–34) related to religion in the future reveals something about the field of futures and foresight as a whole. As has been observed, futurists in general have tended to ignore issues such as religion (Coates and Jarratt 1990, 28; T. M. Johnson and Barrett 2004), and based on these findings it would seem that LLMs taking the same role are following in their footsteps – the change should therefore begin with human professionals.

6.2 Statistical relationships between the six themes

Intuitively, some of the six themes related to religion and the secular sacred seem closer to each other, while others might even be opposed. For example, holistic spirituality and ecospirituality include very similar representations, as described in Chapter 5. Whether this intuitive understanding is supported by the large language models’ images of the future can be found by looking at the statistical relationships between the themes. Simply explained, the research data can be analyzed from the perspective of whether some themes are noticeably more or less often present in the same images of the future – if this were true, it would suggest a connection between these themes. Brief introductions of the statistical methods used here to examine these connections, factor analysis and log-linear regression, can be found in Chapter 4.3.

The visual output of factor analysis illustrates some of the presumed findings about the relationships between the themes, but it has some surprising elements as well. Figure 2 depicts values of two factors created from the research data on the x and y axes, with names of the themes in locations that reflect their relationship to these two factors. On the horizontal x-axis, we find the themes of holistic spirituality and ecospirituality right next to each other, with traditional culture & religion relatively close, while transhumanism is placed on the opposite end. This signals that in images of the future that include transhumanist representations, these three themes on the right-hand side of the plot are less likely to appear. Still, the

themes are not exactly opposites in the research material and instead are relatively often found together, despite what the large volume of empty space in the diagram might indicate.

On the vertical y-axis, a more surprising observation can be made related to how the second factor for the most part only takes into account the themes of secular humanism and digital humanism. This suggests that the two themes are somewhat independent from the others as they are in the statistical center of the first factor, but that their occurrence can be explained to some degree with each other. Especially the theme of secular humanism is strongly correlated with this second factor, so we can assume that if the image of the future includes this theme, it probably includes digital humanism as well. Whether this conclusion is useful is arguable, as digital humanism is included in the vast majority of the images of the future in either case.

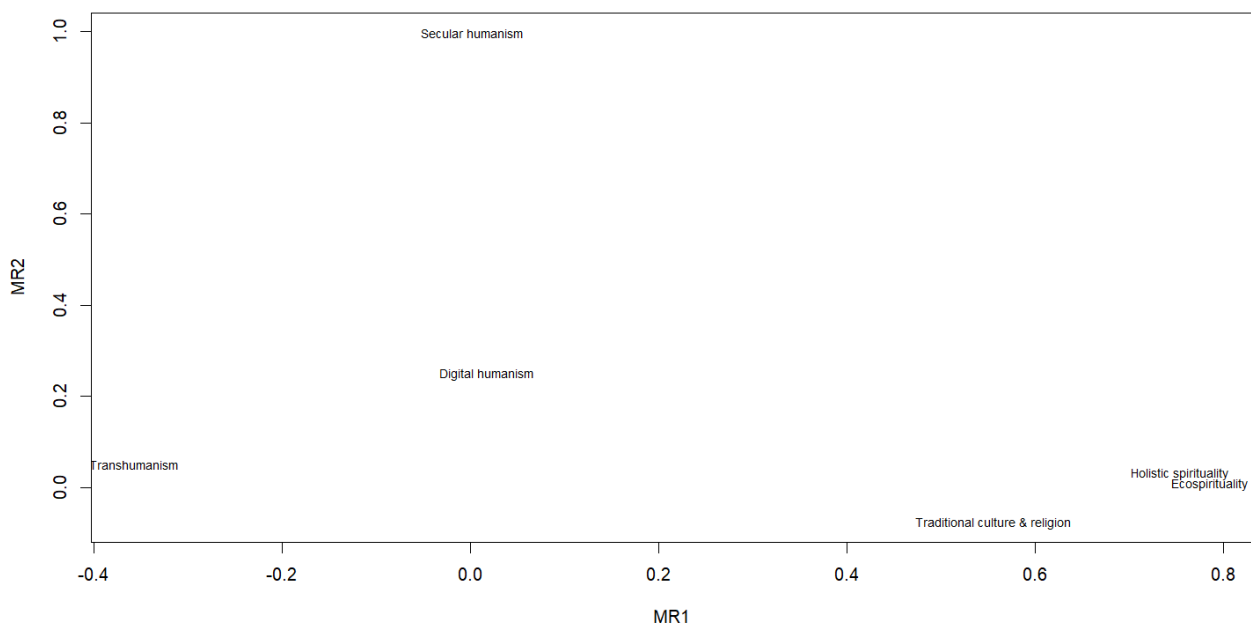


Figure 2. Plot of factor loadings for a factor analysis of two factors with the six themes of the data as variables, created with RStudio.

The goal of factor analysis is usually to identify broader trends that might explain the changes in multiple variables – such as general positive or negative sentiment explaining changes in a variety of emotions in psychological surveys (Gorsuch 2014). With the first factor, this type of trend could be simplistically described as the opposition between technology and spirituality, where images of the future statistically include more commonly either representations related to the more spiritually inclined themes or to transhumanist elements, not both. This juxtaposition, which does not completely reflect the multifaceted relationship between technology and religion, is most likely based on the opposition of (mostly) fundamentalist religious

groups towards technology (cf. Barzilai-Nahon and Barzilai 2005). Regarding the second factor, a similar trend is difficult to identify, since so few themes are connected to it.

In addition to factor analysis, the research data allows for the use of log-linear regression and modeling, which is used to model relationships between variables. Log-linear models could be used for example to predict the chance a certain theme is included in an image of the future if we know which other themes are included. However, as often is the case, practical use of the model might not be feasible. With this study, the creation of a log-linear model was attempted through optimizing the model based on the commonly used Akaike Information Criterion (AIC) (Vogt and Johnson 2016), and the resulting formula given for explaining the relationships between the themes can be seen in Figure 3. As is apparent, the model includes too many relationships between the themes to meaningfully analyze, and we can intuitively assume that most of them are not that relevant – in statistics, this issue is known as the overfitting of a model (Vogt and Johnson 2016; Sachs 1984). Despite this, we can make use of some of the results from the process of log-linear regression.

```
> summary(best_model)
Formula:
count ~ t1 + t2 + t3 + t4 + t5 + t6 + t1:t2 + t1:t3 + t2:t3 +
      t1:t4 + t2:t4 + t3:t4 + t1:t5 + t2:t5 + t3:t5 + t4:t5 + t1:t6 +
      t2:t6 + t3:t6 + t4:t6 + t5:t6 + t1:t3:t4 + t2:t3:t4 + t2:t3:t5 +
      t2:t4:t5 + t3:t4:t5 + t1:t2:t6 + t2:t4:t6 + t3:t4:t6 + t1:t5:t6 +
      t2:t3:t4:t5
```

Figure 3. Formula for a log-linear model for the data, optimized according to the AIC criterion with RStudio software.¹³

The log-linear model uses as its basis a dataset known as a contingency table, which lists the frequency of each individual combination of variables – in this case, images of the future that include a unique combination of themes (Vogt and Johnson 2016). Found in Table 3, these combinations of themes can be analyzed by themselves as well, which can provide interesting insight through examining which combinations are more common than others.

¹³ It should be noted that the numbers of the themes here do not correspond to the order they are introduced in the text otherwise. However, this is not significant, as drawing conclusions based on the formula of the model will not be attempted.

Table 3. Contingency table displaying how many times each combination of the six themes is found in the images of the future (X indicating that the theme is included, and 0 that it is not).

Digital hu- manism	Secular hu- manism	Transhu- manism	Holistic spirituality	Ecospiritu- ality	Traditional religion & culture	Number of similar im- ages of the future
0	0	0	0	0	0	3
X	0	0	0	0	0	4
X	0	0	0	X	0	1
0	0	X	0	0	0	7
X	0	X	0	0	0	13
X	X	0	0	0	0	2
X	X	0	0	X	0	2
0	X	X	0	0	0	2
X	X	X	0	0	0	13
X	X	X	0	X	0	2
0	0	0	0	0	X	1
X	0	0	0	0	X	1
0	0	X	0	0	X	1
X	0	X	0	0	X	3
X	X	0	0	0	X	1
X	X	X	0	0	X	3
X	X	X	0	X	X	1
0	0	X	X	0	0	1
X	0	X	X	0	0	2
X	X	0	X	0	0	6
X	X	0	X	X	0	6
0	X	X	X	0	0	1
0	X	X	X	X	0	2
X	X	X	X	0	0	2
X	X	X	X	X	0	1
X	0	0	X	X	X	1
X	0	X	X	0	X	1
0	X	0	X	X	X	3
X	X	0	X	0	X	2
X	X	0	X	X	X	8
X	X	X	X	0	X	1
X	X	X	X	X	X	11

From the contingency table, we can observe that the most frequent combinations of themes in the images of the future are those that include only the three most common themes of digital humanism, transhumanism and secular humanism, only digital humanism and transhumanism, and on the other hand, images of the future including all the six themes. Many combinations are completely absent, and most are found only once or twice in the research material. This suggests that there are clear patterns in how the LLMs imagine different futures, which supports the conclusions in other parts of the study regarding the limits of diversity in the images of the future.

A common practice in the follow-up analysis of a log-linear model is to look at relevant relationships between two or more specific variables, to discover what kind of relationship the model has identified (Vogt and Johnson 2016). This is commonly done through cross-tabulation of the respective variables. In the following, selected cross-tables are provided which will illustrate relevant relationships between pairs of themes. The pairs have been chosen based on observations made in the process of content analysis as well as from the factor analysis and contingency table introduced above. To a lesser extent, the formula describing the statistically optimized log-linear model has also been examined to identify if it would provide hints into which relationships could be significant.

In table 4, the relationship between the themes of holistic spirituality and ecospirituality that were found to be closely related in the factor analysis is cross-tabulated. We can observe that there are significantly more images of the future that include both of the themes than those that include only one of them. This suggests that their representations are closely related, which is supported by both the qualitative analysis in this study as well as previous research on the themes (e.g. Choné 2017; Taylor 2010; Gould et al. 2024). The same conclusion can be drawn with the theme of traditional culture & culture and its relationship to these two themes, and the cross-tables are similar in these cases as well.

Table 4. Cross-table of the frequencies of images of the future including the themes of holistic spirituality and ecospirituality.

	Ecospirituality not included	Ecospirituality included
Holistic spirituality not included	54	6
Holistic spirituality included	16	32

Table 5 illustrates the relationship between the themes of secular humanism and digital humanism, where a similar effect is noticeable in that more images of the future include both themes than only one of them. Here the main difference is that there are less images of the future that include neither theme, which is connected simply to the fact that these are two of the most common themes in the research material, while holistic spirituality and ecospirituality occur in almost half as few images of the future. The strong connection between secular humanism and digital humanism is similarly intuitive and supported by both philosophies originating from general humanist ideas (Kurtz 2007; Nida-Rümelin and Staudacher 2023; Werthner et al. 2023).

Table 5. Cross-table of the frequencies of images of the future including the themes of secular humanism and digital humanism.

	Digital humanism not included	Digital humanism included
Secular humanism not included	13	26
Secular humanism included	8	61

On the other hand, some of the themes are found less often in connection with others than separately. An example of this is found in Table 6 with the cross-table of the images of the future including the themes of transhumanism and ecospirituality. There are less images of the future that include both themes than those that include only one or neither, which suggests that they are in some way opposed to each other. This finding reflects the visual observations from factor analysis, and cross-tables of holistic spirituality or traditional culture & religion with transhumanism show a similar trend, although to a lesser extent.

Table 6. Cross-table of the frequencies of images of the future including the themes of transhumanism and ecospirituality.

	Ecospirituality not included	Ecospirituality included
Transhumanism not included	20	21
Transhumanism included	50	17

Despite the clear correlations between at least some of the themes identified here, conclusively describing how the LLMs statistically represent different elements of religion and the secular sacred would require much more elaborate methods and likely a different type of dataset. This goal can even be said to be impossible, with how complex and non-transparent most of the language models are (Ray 2023; Minaee et al. 2024). Even if any causal

relationships could not be discovered in this case, we can assume that the findings that have been made are broadly generalizable to the various contexts in which the LLMs examined here might be used to discuss about the future, as the data has been generated with random experiments and as general descriptions of the future (Vogt and Johnson 2016; Sachs 1984; Park, Schoenegger, and Zhu 2024; Kovač et al. 2023). This extends to other LLMs as well, since the training datasets and principles have so far been very similar across the competitors (Minaee et al. 2024).

6.3 Possible futures

Table 7. Frequency of the six themes in possible images of the future.

Name of the theme	How many images of the future the theme is represented in	Frequency of the theme in possible images of the future	Frequency of the theme in all images of the future
Digital humanism	26	72 %	81 %
Transhumanism	25	69 %	62 %
Secular humanism	21	58 %	64 %
Holistic spirituality	14	39 %	44 %
Ecospirituality	11	31 %	35 %
Traditional culture & religion	9	25 %	35 %

Out of all the representations of the six themes in the images of the future, 106 of them are in the 36 possible futures that form a third of the total material. In the other two thirds, probable and preferable futures, 101 and 140 representations are found, respectively. Although theoretically a similar result could have been achieved through random chance even if the three types of futures were actually identical in terms of the representations, it is extremely unlikely – the relevant statistical test¹⁴ gives a p-value of 0.02038 for the frequencies in this data. This means that possible and probable futures can be said to statistically significantly include less diverse representation of religion and the secular sacred. Qualitative exploration of the images of the future also confirms that in addition to the diversity, the numbers reflect the frequency

¹⁴ Pearson's chi-square test, which is used to evaluate how likely it is that an observed difference between sets of data – here the three different frequencies – arose purely due to random chance. For the significance of p-values, refer back to Chapter 4.3.

of the representation as well. With the remaining two groups, possible futures include more representation of religion and the secular sacred than probable futures, which ranks last based on both the numbers as well as the observations made during the analysis.

In possible futures, the most common theme is that of digital humanism, although transhumanism comes close. With the exception of transhumanism and secular humanism changing places, the order of which themes are represented the most often is the same as in the images of the future as a whole – see the two right-most columns of Table 7 for this comparison. This fits well with the role of the possible futures as arguably the most neutral out of the three types of futures. Although the preferable futures were not explicitly defined as having to be possible, in practice human imagination defaults to describing futures that are in the realm of possibility (Hancock and Bezold 1994). We can assume the same to be true for the LLMs, since their preferable futures did not emerge during the analysis as any more impossible than the others. With probable futures by definition belonging into possible futures, possible futures then incorporate the rest of the three types and act as a sort of baseline, which we can here use for the purposes of comparison.

The percentages of how many images of the future out of the 36 possible futures include a certain theme are found in the middle of Table 3, and similar percentages for the other types of futures are found in the following tables. These percentages in the possible futures are relatively similar across the board when compared to the images of the future in general. Although this is to be expected with possible futures being “neutral” descriptions of the future, it might also suggest that the LLMs view probable and preferable futures as opposites in some way, and possible futures as something in-between – this is something that will be investigated in the following sections. The analysis of possible images of the future could be made more interesting if there were “impossible” futures to compare them to, but since this is not the case, we can move on to probable and preferable images of the future.

6.4 Probable futures

In the 36 probable images of the future, the themes related to religion and the secular sacred are represented a total of 101 times – averaging just under three themes per each image of the future. The frequencies of the six themes in the probable futures can be seen in Table 8, following this text. Compared to those of possible futures and the images of the future in

general, we can find some notable differences. First, the order of the prevalence of the six themes is different: similarly to possible futures, transhumanism is in second place instead of secular humanism, but here traditional culture & religion has also risen to fourth place from the last. This finding is very interesting, since otherwise religion and the secular sacred seem to be represented less frequently in probable futures, which qualitative analysis also confirms.

Table 8. Frequency of the six themes in probable images of the future.

Name of the theme	How many images of the future the theme is represented in	Frequency of the theme in probable images of the future	Frequency of the theme in all images of the future
Digital humanism	31	86 %	81 %
Transhumanism	24	67 %	62 %
Secular humanism	18	50 %	64 %
Traditional culture & religion	12	33 %	35 %
Holistic spirituality	11	31 %	44 %
Ecospirituality	5	14 %	35 %

The relative prevalence of the representations of traditional culture & religion could be theorized to result from the tendency to associate probable futures with business-as-usual outcomes (Hancock and Bezold 1994). Since what is here defined as traditional culture & religion has a significant impact on our life today, the probable images of the future might reflect this. Despite this possibility, it should be noted that the theme is still represented in probable futures on average less often than in general (33 % vs. 35 %), so its relatively higher ranking might have as much to do with why the other themes are more often absent in the case of probable futures.

Especially the theme of ecospirituality emerges as uncommon in comparison with the images of future in general, occurring in only 15 %, or 5 out of the 36 probable images of the future. This too might be connected to the idea of a business-as-usual development, since ecospiritual ideas today comprise still a fairly minor movement (Bock 2024; Choné 2017). Additionally, qualitative analysis shows that ecospiritual elements are often represented as desirable outcomes, and that the probable futures include the most amount of dystopian or undesirable scenarios out of the three types. Why the LLMs describe probable futures in less optimistic terms than the others most likely comes down to our own lack of confidence in what the future will bring (Kantenbacher et al. 2022; Rubin 2013).

On the other hand, the themes of digital humanism and transhumanism are represented more often in the probable images of the future than otherwise. The fact that transhumanist representations are the second most common in probable futures is at first counterintuitive, when we look back at what kind of technologies are represented under the theme: space colonization, global neural networks and telepathy, among others. This is highlighted especially compared to the other themes where technological developments are not necessary, and where many of the practices and ideas are already present today, if on a smaller scale. These observations can be seen as an example of the conflicts and contradictions often present in images of the future (cf. Rubin 2013, 40–41), and based on qualitative exploration of the material, probable futures might actually be the most techno-optimistic out of the three types, which the prevalence of transhumanist representation exemplifies.

These findings suggest that the LLMs view even extreme technological developments as a more probable driver of change than religion, spirituality or other cultural factors. Even though the partially critical representations of digital humanism are also overrepresented in the probable futures, they are often only sidenotes pointing attention to discourses on the ethical use of technology, while simultaneously emphasizing the positive effects of technological development on our life in the future. The proliferation of technological determinism and techno-optimism in the probable images of the future might be one of the most dangerous findings observed in this study, since if these scenarios would be taken as factual, we could stop working against climate change and other issues in the belief that technology will solve everything in the future. The same danger has been identified in research on technological optimism and “innovationism” (Clark, Robert, and Hampton 2016; Valaskivi 2020).

This shows that despite the many capabilities of the AI models, using them to predict the future by asking for descriptions of probable futures would be misguided. In addition to the unfounded views on technological development, the other biases related to the representation of religion and the secular sacred are also present in the probable images of the future. The secular western perspective might reflect current trends relatively accurately, but the LLMs take it to the extreme both in the degree of secularization as well as the geographical scale, since the descriptions are of the futures of the whole humankind. In the defense of the LLMs it should however be said that the chatbots never claimed that their predictions were in any way accurate – although this does not preclude someone from making that assumption.

Based on these observations and the previous research on AI biases (e.g. Naous et al. 2024; Rozado 2023; Berg 2024), there should be no question that even the issue of which elements could most probably exist in the future is not neutral and free from presuppositions built into the language models. This is especially true in the context of futures, since as Anita Rubin writes, images of the future are always composed of “beliefs, expectations, opinions, and assumptions of what the future might be like” (Rubin 2013, 40). One purpose of this study, and especially of the perspective of religion and the secular sacred, is to bring attention to how these beliefs and assumptions manifest in how the LLMs describe alternative futures. With probable futures, the inclusion of transhumanist elements points to techno-optimist attitudes while the invisibility of religion and spirituality reveals a dominant secular worldview.

Remembering that our images of the future contribute to producing the future that comes to be (Bell and Mau 1971; Rubin 2013), the representations in the probable images of the future created by the LLMs have the potential to influence what we ourselves see as probable or even possible in the future. This illustrates the politics of representation discussed – among others – by Stuart Hall, where what is represented depends on and reproduces societal power dynamics (Hall 1997; 2011). The invisibility of religion and spirituality, especially in its non-secularized and non-western forms, can be viewed as “representational silence” (cf. Hall 2011; Berg 2024, 33–34) and should be questioned as it dismisses the religious identity of globally very large populations. Whether this representational silence appears primarily in supposedly fact-based probable images of the future, or also in preferable futures oriented towards desirable values, will be discussed in the next section.

6.5 Preferable futures

Comparing the total frequencies of the six themes of religion and the secular sacred, preferable images of the future have by far the most representations associated with them, 140 compared to the just over 100 in the two other types of futures. While it is theoretically possible that this is simply due to the larger variety of themes – which itself would be a significant result – qualitative analysis of the images of the future confirms that the futures generated as “preferable” according to the language models do include more references to religion and the secular sacred.

This conclusion should be emphasized, because it shows a counterpoint to the otherwise secular orientation of the AI models: religion and the secular sacred are seen as belonging more to the preferable visions of the future than those that are more neutral or even undesirable. By extension, the representations of most of the six themes can be seen as desirable from the perspective of the models, although final conclusions on the value orientation of the LLMs should not be based on this alone. Still, we can look at which themes are overrepresented or underrepresented in the preferable images of the future, which will be done in the following.

Table 9. Frequency of the six themes in preferable images of the future.

Name of the theme	How many images of the future the theme is represented in	Frequency of the theme in preferable images of the future	Frequency of the theme in all images of the future
Digital humanism	30	83 %	81 %
Secular humanism	30	83 %	64 %
Holistic spirituality	23	64 %	44 %
Ecospirituality	22	61 %	35 %
Transhumanism	18	50 %	62 %
Traditional culture & religion	17	47 %	35 %

From Table 9 above we can see that almost all of the six themes, apart from transhumanism, appear more often in preferable images of the future than in general, with the largest discrepancies being in the themes of ecospirituality (61 % vs. 35 %) and holistic spirituality (64 % vs. 44 %). This finding is very significant, because it calls into question the assumptions of techno-optimistic and secular bias that have been suggested by the observations in this and other studies on AI applications (e.g. Berg and Valaskivi 2023a; Berg 2024; Plaza-del-Arco et al. 2024). To put these findings into context, we can try to look at previous research on the value orientation of LLMs, to find whether it can explain this sudden preference for the sacred and the spiritual.

The short answer is that explaining these preferences with previous research is not likely. As mentioned in the introductory chapter, depending on context the values found from the answers of language models have been both conservative and liberal, as well as in some cases multicultural and in others dominated by one perspective (Rozado 2023; Park, Schoenegger, and Zhu 2024; Tsuria and Tsuria 2024; Tao et al. 2024). While we can reliably assume that the values of the models are fairly similar to those of mainstream western societies,

pinpointing where exactly the preference for a single topic, such as the spiritual elements here, comes from is difficult if not impossible. This dilemma illustrates in a practical sense why the models are often called black boxes, since not even their developers know exactly where each line of text originates from (Ray 2023; Minaee et al. 2024). Therefore, all we can conclude based on available data is that for some reason or another, these representations are seen as preferable in terms of the future.

Similar considerations can be applied to the question of why transhumanism is the only theme that is represented less often in the preferable images of the future than in general. This too goes against the general trend of the LLMs' descriptions of the future, where technological optimism is possibly the most fundamental value. However, a closer look at the texts generated by the LLMs shows that the technological optimism is still very much present, but its manifestations are focused more on issues such as health and the environment instead of human augmentation or space colonization. Based on these observations, there does seem to be a distinction between probable and preferable images of the future, where especially the role of technology and spirituality have small yet noticeable differences.

Part of this distinction comes from probable futures including dystopic scenarios, which are usually imagined as opposites to preferable futures. A simple dichotomy between utopias and dystopias however does not adequately describe the material, where a vast majority of the futures would be seen as desirable by most people. Coming back to the idea expressed in Chapter 6.3 about possible futures as a halfway point between probable and preferable futures, the spectrum between the two could be instead conceptualized as moving from something closer in values to our own society – probable futures – to something with different ideas of what is important – preferable futures. This idea is supported by the business-as-usual logic observed with probable futures, as well as the relative novelty of the representations more commonly found in some of the preferable futures.

These preferable futures are one area where some credit must be given to the AI models, since they manage to explore possible changes in our values, where we often are stuck in assuming that human nature remains similar (Bell and Mau 1971; Rubin 2013). Still, there is a danger in uncritically accepting these images of the future without evaluating how these changes could come to pass. The language models for the most part do not give clear explanations either, apart from one future scenario where contact with extraterrestrials serves as a trigger for this

mental evolution: “Humanity establishes contact with other intelligent life forms, expanding our understanding of the universe and our place within it (2,3,3,4).”¹⁵

While probable images of the future – and what is represented in them – co-created with AI applications might influence our ideas of what we see as possible, involving LLMs in the discussion of preferable futures could respectively affect our values and goals (cf. Bell and Mau 1971; Rubin 2013). The author’s educated guess, based on contemporary discussions around AI and its different use cases is that AI use will, at least in the short term, keep to the role of a “neutral” advisor on topics such as which developments are probable in the future. Values and ethics are often seen as a “secular sacred” area where leaving the discussion to humans is seen as intrinsically valuable, which suggests that the impact of the representations looked at here will likely be less significant in practice than those of the possible and probable futures.

Despite these considerations relative to the other two types of futures, it is good to remember that in general the preferable images of the future are not that different from the others, which the examples in Appendix 1 help to illustrate. Even the opposition between probable and preferable futures is in the big picture less significant than the variation found inside each of the three types of images of the future. The differences between each type would most likely have been stronger if the prompts were given consecutively within the same conversation, as the LLMs take the context of the conversation into account in their responses (Park, Schoenegger, and Zhu 2024; Dengel et al. 2023). Although the choice was made here to “reset” the LLMs after four repetitions of the same type of prompt as described in Chapter 4.1, future studies focusing explicitly on this comparison could utilize a method like this. As we have seen in the preceding chapters, the chosen methodology has still allowed for the analysis of differences between the three types of futures, and in the next section a similar approach will be implemented to compare the three LLMs.

6.6 Comparison of the different large language models

Utilizing the frequencies of how many images of the future include certain themes of religion and the secular sacred, we will next compare the three large language models (LLMs) used in this study, to see if there are any differences in their representation of these themes. In

¹⁵ The code (2,3,3,4) refers to a preferable future created with Gemini – for more on these codes, refer back to Chapter 4.1.

previous research comparing different LLMs and other AI applications, disparities between their cultural and religious representation and related biases have been identified (Vicsek et al. 2024; Berg 2024, 68), and the same can be argued to be true when comparing ChatGPT, Gemini and Deepseek, based on the material in this study. In the following table (Table 10), the frequencies of how many of the 36 images of the future created by each of the three LLMs include each of the six themes can be seen.

Table 10. Frequencies of the six themes in images of the future created by the three different LLMs.

Name of the theme	ChatGPT	Gemini	Deepseek
Digital humanism	30 (83 %)	24 (67 %)	33 (92 %)
Transhumanism	26 (72 %)	21 (58 %)	20 (56 %)
Secular humanism	24 (67 %)	17 (47 %)	28 (78 %)
Traditional culture & religion	22 (61 %)	1 (3 %)	15 (42 %)
Ecospirituality	20 (56 %)	4 (11 %)	14 (39 %)
Holistic spirituality	17 (47 %)	11 (31 %)	20 (56 %)
All themes	139	78	130

We should first pay attention to the stark difference in the frequency of representation between Gemini and the other two LLMs, with images of the future created by Gemini including on average almost half as few of the six themes. With the relevant statistical method of testing whether a difference of this magnitude could emerge based purely on chance, we get a p-value of 0.00008485, which indicates that this would be extremely unlikely, and therefore it should be investigated further.¹⁶

A natural explanation for this difference comes from the fact that the images of the future that Gemini has created in response to the prompts used in this study are on average significantly shorter than those created by the other two LLMs. Gemini's descriptions of the future range from 200 to 500 words, while ChatGPT and Gemini have produced at times even 700 or 800 words when responding to the same prompts. These differences certainly impact the representation of religion and the secular sacred, since with a smaller word count there is less space to include multiple different themes. Therefore, based on this alone, it is difficult to conclude that Gemini is less inclined towards religion and the secular sacred than the other LLMs.

¹⁶ Pearson's chi-square test, which is used to evaluate how likely it is that an observed difference between sets of data – here the three different frequencies – arose purely due to random chance. For the significance of p-values, refer back to Chapter 4.3.

However, the relative frequencies of the six themes across the three LLMs show that Gemini's images of the future stick out even if we take into account the difference in the length of the texts analyzed. Most notably, while the themes of traditional culture & religion and eco-spirituality are found only in 1 and 3, or 3 % and 11 %, of Gemini's images of the future, digital humanism and transhumanism both are included in over half the futures (67 % and 58 %, respectively). This suggests that the value orientation of Gemini in the context of the future has an even stronger emphasis on technology than the other two AI models. Especially the prominence of transhumanist representations is significant, so much so that we could nominate Gemini as the transhumanist LLM.

Why this is the case is difficult to resolve, and the root cause is likely based on factors emerging from the training data, as is often the case (Naous et al. 2024; C. Li et al. 2024; Wang et al. 2024). In a previous comparison between ChatGPT and Bard regarding their support for LGBTQ+ issues (the former name of Gemini), researchers found that Bard emphasized human rights in favor of cultural relativism (Vicsek et al. 2024) – whether this finding has any relation to transhumanist attitudes remains unclear. Another speculative train of thought can be followed by looking at the central role that prominent transhumanists such as Ray Kurzweil have at Google (Corbyn 2024): it has been even shown empirically that the values and ideological stances of LLMs tend to reflect the worldviews of their developers (Buyl et al. 2025).

In a similar fashion, we could look at the representation of the six themes in the images of the future created by the Chinese LLM Deepseek, where we can notice that especially holistic spirituality and secular humanism emerge in comparison to the other two LLMs. Intuitively, it would be easy to attribute this to the importance of traditional Chinese medicine and other well-known holistic phenomena that are more common in the global east (Sun et al. 2013). While these factors might contribute to this noticeable difference, qualitative analysis of the images of the future shows that the way in which the elements of holistic spirituality are written about is very similar across all three LLMs, which does not indicate that the training material has differences of this degree. This is further supported by the fact that no actual Chinese or other traditional medical and spiritual practices are mentioned in the images of the future.

ChatGPT seems to have the most diversity in its representation of religion and the secular sacred, with even the least common theme of holistic spirituality occurring in nearly half (47 %) of images of the future created with the LLM. Especially the themes of traditional religion &

culture and ecospirituality appear significantly more often than in the futures of the other two AI models. When the diversity of religious and secular sacred representation is seen as desirable, ChatGPT emerges as the most successful out of the three LLMs, which is most likely connected to the larger size of the model and the resources that its competitors do not have (Minaee et al. 2024; Wu et al. 2023). Although it seems that some of these resources have been employed to increase the diversity in how the AI model views the future, the limits of this diversity show that it has not likely been a priority in the development, not with ChatGPT or the other models.

To end these comparisons, we can cross-tabulate the frequency of the representation of the six themes across both the three LLMs as well as the three types of futures: possible, probable and preferable. This exercise will indicate if one language model includes more of the six themes in possible futures than the others, for instance. Recalling from the previous sections, the preferable futures include in general the most representations, so the same should and will be seen here, as the table below (Table 11) illustrates. Comparisons similar to the preceding analysis, regarding the relative frequencies and their differences, can however be made here as well, although the conclusions will be significantly briefer.

Table 11. Comparison between the three LLMs with the frequencies of representations in the three different types of futures.

Type of future	ChatGPT	Gemini	Deepseek
Possible	42	24	40
Probable	40	25	36
Preferable	57	29	54

ChatGPT and Deepseek follow the trend of preferable futures including the highest level of representational diversity, followed by possible and probable futures. Gemini sticks out here as well though, since its probable images of the future actually include more representation of religion and the secular sacred than possible futures, and overall the three types are closer to each other than with the other two LLMs. If we apply the same statistical test here as in previous contexts, the p-value we receive is 0.764 which suggests that differences of this magnitude could easily occur purely due to random chance.¹⁷ What this means is that with Gemini there seems to be less of a distinction between possible, probable and preferable futures in the

¹⁷ The statistical test used here and previously is known as Pearson's chi-squared test, explained in Chapter 4.3. For the significance of p-values, refer back to the same chapter.

diversity of religious representation. This can however be misleading, because Gemini also included relatively the most transhumanist representation, which is more common in probable futures as explored in Chapter 6.4. Therefore, finding the root cause for this observation would require further analysis not possible with the limits of this work.

Overall, conclusions about the differences between the three LLMs should not be drawn hastily, despite the clear divergences in the frequencies of the six themes. In addition to the speculative ideas expressed above, there are probably tens of other possible reasons for why some themes are represented more often in the futures imagined by one model than in others – including pure coincidence (Ray 2023; Minaee et al. 2024; Motoki, Pinho Neto, and Rodrigues 2024). Whether or not these differences in value orientation regarding the future are intentional or not, the methodology demonstrated in this study can be seen as a valuable tool for evaluating different AI models.

7 Conclusions

7.1 Discussion

The main conclusion that can be made about the representation of religion and the secular sacred in the images of the future is that the six themes created in this study seem to encompass the representations almost too well. During the analysis, there were rarely moments of difficulty in categorizing the representations of religion and the secular sacred, once the relevant themes were identified and created. What this suggests is that despite a vast material of a total of 108 images of the future, and the special attention paid to the methodology of prompting the large language models (LLMs), their views on what kind of elements can be found in possible, probable and preferable futures are limited in thematic diversity. However, in light of these apparent limitations, it is perhaps surprising that on a first glance, there seems to be plenty of variation in the images of the future.

The three examples in Appendix 1 illustrate well this apparent diversity, since on the level of details they include very different elements. A similar pattern can be found from the rest of the material, and on the whole the LLMs have managed to create a commendably varied collection of descriptions of futures in 2050. Looking under the surface and ignoring the details unfortunately shows a different picture, where a limited number of themes repeat, as has been shown with religion and the secular sacred here. Previous studies with a similar approach indicate that comparable findings would result even with a different initial focus (e.g. Park, Schoenegger, and Zhu 2024; Naous et al. 2024).

However, even before any analysis of the LLMs' images of the future is necessary, their diversity is also overshadowed by another observation. What has been referenced in previous sections of the text as "meta-level themes" are one of the first things that stand out when two or more images of the future are compared. The two most relevant of these underlying themes are an optimistic and deterministic attitude towards technology and an emphasis on cultural diversity. While the terminology related to these is often relatively neutral and therefore their mentions do not emerge as representations of religion and the secular sacred, except when connected to the six themes of this study, it is clear that these and other similar values underpin practically all of the LLMs' images of the future. Even though human conceptions of the future are not necessarily any more diverse than those of the AI models (Kantenbacher et al. 2022; Rasa, Lavonen, and Laherto 2023; Rubin 1998), instead of organic information

exchange the source of these biases is in the structure of the models. This algorithmic bias in the discourses on the future should be viewed critically since it has the potential to propagate and influence our own views (Bell and Mau 1971; Rubin 2013).

Coming back to the findings of this study on the representation of religion and the secular sacred, the relative importance of the six themes can be also seen as resulting from AI bias. The naming of the three most common themes – digital humanism, secular humanism, and transhumanism – illustrates the significance of general humanist ideas and elements in the images of the future, compared to those related to religion and spirituality more specifically. Taking clues from previous research (Berg and Valaskivi 2023a; 2023b; Berg 2024; Plaza-del-Arco et al. 2024), the hypothesis of secular bias based on the Western context from which most of the LLMs' training data comes from, is supported by the findings of this study. Compared to the influence of religion and spirituality today, it is concerning how few mentions of these topics can be found in the images of the future – although this issue is present in human-generated ideas about the future as well (cf. Kantenbacher et al. 2022; Rubin 2013; Kaboli and Tapio 2018).

A related general trend that can be observed with the representations of religion and secular sacred is that the themes found in the images of the future are relevant in contemporary discussions about the future, but that the LLMs for some reason or another amplify them to a degree that seems unnatural. Prime examples can be found in the technological miracles related to transhumanist representations, which the AI models include in over half of the images of the future. Similarly, some ideas such as the combination of medicine and spirituality, or science and tradition, emerge as a reoccurring trend in the futures imagined by the LLMs. On the level of vocabulary, terms such as mindfulness or interconnectedness could be even utilized as metonymical expressions of their respective themes – holistic spirituality and ecospirituality – with how often they appear, which provides some clues into why other terms repeat and others are completely absent.

The relative prevalence of spiritual ideas and practices in the images of the future points to another trend in the move from traditional religion toward more flexible expressions of spirituality. This too has been observed in previous research on humans (Heelas and Woodhead 2005; Knott, Poole, and Taira 2013), yet the scale is again significantly broader in the case of the AI models' visions of the future. Given the significance of spirituality and the secular sacred, it is puzzling that nearly all research on religion and AI so far has been done from the

perspective of established religious traditions (e.g. Reed 2021a; Löffler, Hurtienne, and Nord 2021; Plaza-del-Arco et al. 2024). Practical reasons naturally explain part of the matter, since it is simpler to research AI use in the context of an active and clearly defined organization like a church than to track down often very loosely organized webs of spiritual practitioners.

Despite – or perhaps as a consequence of – limited representation, various religious organizations have been active in adopting and discussing AI tools (Trotta, Iannotti, and Rähme 2024; Singler and Watts 2024), and efforts have been even made to design chatbots with a “biblical worldview (Andre 2023). Since the role that the LLMs prescribe organized religion in the future is not necessarily ideal from the perspective of the religious, it can be assumed that contemporary religious actors would aim to change this, if the trend of increasing AI use continues. It is likely that their perspectives would be taken into account in AI development, since similar discussions are already ongoing related to cultural bias (e.g. Naous et al. 2024; Li et al. 2024). If changes from discussions such as these do not happen, we can expect the views of the LLMs on the future to perpetually steer us towards secularization if we take them at face value.

In comparisons between possible, probable and preferable images of the future, preferable futures include representations of the six themes significantly more commonly than the other two categories. This observation provides a counterpoint to the otherwise secular predisposition of the AI models, especially when the themes affected the most are those of holistic spirituality and ecospirituality. Additionally, it illustrates how the LLMs are not singular entities with consistent values (cf. Kovač et al. 2023; Ray 2023), so that even if elements of western secularism are identifiable in their responses, it does not exclude in some contexts a preference for spirituality, as can be seen here.

The six themes and their relationships in the images of the future have been further analyzed with the help of selected statistical methods. An opposition between the techno-optimistic transhumanist representations and the spiritual elements of ecospirituality, holistic spirituality and traditional culture & religion has been observed, although its importance should not be overstated. For the most part, all of the six themes can be found in connection with each other, and the combination of all themes co-occurring in a single image of the future is actually the third most common combination in the material (see Table 3 in Chapter 6.2).

A similar conclusion can be drawn regarding the comparisons between the three LLMs used in this study. While some clear differences are noticeable, for example in which themes are

represented most often in futures created by each AI model, their ideas about the future are overall extremely similar. This is most likely connected to the use of homogenous English-language training data (cf. Tao et al. 2024; Cao et al. 2023; Wang et al. 2024; Minaee et al. 2024), so that even the Chinese LLM Deepseek did not stick out from the others. Different conclusions might have followed if other languages such as Chinese were used in prompting the LLMs, but unfortunately this was beyond the scope of the study and the language skills of the author.

With AI development the findings of this study indicate that more resources should be dedicated to examining the biases of the models, be it regarding their ideas about the future or otherwise. Even if the LLMs would only reproduce our own biases – which they do, while adding some additional distortions – the fact that they appear as neutral actors is at best misleading, and potentially even dangerous, when someone believes that the future really could include only what the AI model has described. If our own ideas of the future become affected by AI models to an increasing degree, this cycle might even start repeating itself with AI training using these ideas as training data and our futures becoming narrower and narrower.

For religion and the secular sacred this would mean wider distribution of western secular perspectives, which dominate the possible, probable and preferable futures imagined by the LLMs. In contemporary study of religion there have been countless arguments critiquing the discourses around religion in early modernity, which created a division between the enlightened west and the superstitious “other” in the east or south (McCutcheon 1997; Fitzgerald 2003). The development of artificial intelligence holds the risk of propagating a similar discourse where the future is drawn in a neutral secular light, despite the completely different reality of vast global communities. Images of the future are seen to always correspond to the ideas and values of someone, whether it be an individual or a larger community (Bell and Mau 1971; Rubin 2013). Since the AI tools analyzed for this study do not have values of their own, it is reasonable to ask to who the images of the future described here belong to.

7.2 Afterword

As described above, the study has overall been successful in answering the research questions and the research objective of exploring how large language models imagine the role of religion and the secular sacred in the future. The choices made during the research design process

have created results that are both novel and based on strong empirical evidence. Despite this, some parts of the research approach can still be questioned and potentially improved for future studies. In the following, two important choices that could have been different are explained. Afterwards, ideas for improving the methodology used in the study are discussed, and finally some options for further research based on the findings here are provided, before concluding the thesis with brief closing thoughts.

In discussions with others about the thesis topic, I have been often asked why I did not ask the chatbots directly about the future of religion, since the futures they describe only include very brief mentions of religion and spirituality. While I did actually experiment with this type of prompting in the beginning stages of the research, it became quickly apparent that it would make examining AI bias in the context of the future unnecessarily challenging for several reasons. Firstly, the responses by LLMs to questions about the future of religion seemed to be more like lists of different religion-related phenomena than cohesive descriptions of the future, which would make it more difficult to analyze them as images of the future. Secondly, the responses focused on mentioning as many trends related to religion as possible, which would call for a more text-level analysis instead of the quantitative comparisons possible here. Thirdly, many of the same themes are recognizable both in descriptions of the future more generally and the futures of religion, so the approach chosen provides extra context on top of the overlapping results. Additionally, the act of querying LLMs about the future in general should be a more relevant practical use case than exclusively asking about religion.

Another issue that was deliberated during the research process was the role of the underlying values or worldviews that could be observed in the images of the future, and that in previous chapters have been referred to as “meta-level themes”. While the choice could have been made to focus on these instead of the surface-level representations as has been done in this study, the main challenge would have been to differentiate between situations where the LLM simply mentions a phenomenon and where it shows something about the worldview built into the AI model. Additional difficulties would emerge when we take into account the fact that LLMs do not have singular worldviews and their values depend on the context of the prompts as well as random chance (Kovač et al. 2023; Ray 2023; Park, Schoenegger, and Zhu 2024). Although meta-level themes such as technological optimism and cultural diversity have been identified in the images of the future, as they have not been in the center of the analysis, what can be said about them and the deeper values of the LLMs here is very limited.

With the research approach used, improvements could be made in at least two areas. In the process of coding and thematization of the representations of religion and the secular sacred, utilizing a larger research team would increase the validity of the analysis, since the final results would not be as dependent on how a single person categorizes the research material (Elo and Kyngäs 2008). Another more difficult change would be to record each word related to the six themes in the images of the future and then calculate the percentage of text that includes each theme, in individual images of the future as well as generally. This type of coding would allow for significantly more elaborate statistical analysis, and with its results the degree to which religion and the secular sacred are included in the images of the future – relative to other topics – could be quantified. It has been used in previous studies in a similar manner as well (e.g. Vicsek et al. 2024).

Experiences from this study can be used as inspiration for further research, both with the research methods and with the selection of topics that are especially relevant in the context of AI and the future of religion. While the focus here has been on keeping the images of the future as neutral as possible, there are fruitful opportunities in using a more detailed context to one's advantage, for example by prefacing the prompt by mentioning that the person asking about the future belongs to a certain faith (cf. Vicsek et al. 2024; Kovač et al. 2023). This could also be used to home in on some of the elements that have been identified as surprisingly significant in this study, such as transhumanism or mindfulness. On the other hand, even with a similar research material, the role of these philosophies and practices in the AI models' ideas about the future could be looked at in more detail in individual studies analyzing which discourses contribute to their emergence.

In the tens of pages in this thesis, various examples of AI bias in the images of the future have been introduced, with accompanying speculation about their origins. With the very real effects that representations have through media such as the LLMs of this study, which are used by millions of people daily, we should move towards minimizing any negative effects they might reproduce. For the billions of people that are not part of the secular west, the images of the future analyzed here might not feel familiar or comforting, even if the AI model describes them as preferable. Although some part of the misrepresentation comes from the mechanics of the AI systems, the bigger picture must include our own ideas about the future and their issues. Whether AI applications over the long run come to enhance or diminish the diversity of our imagination in this context remains to be seen.

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Appendices

Appendix 1. Examples from the images of the future created by LLMs

In the following, three examples from the images of the future are given, one from each LLM: ChatGPT, Gemini and Deepseek. The three examples are also all from different types of future out of the three that are looked at in this study: possible, probable and preferable.

This first example is created with ChatGPT, as a probable image of the future.

The code of the image of the future: (1,2,3,3). For more on the meaning of the codes, refer back to Chapter 4.1.

A Third Probable Future in 2050

In this vision of 2050, humanity achieves breathtaking advancements in some areas but faces significant upheaval due to choices made—or avoided—earlier in the 21st century. This future balances innovation with stark divides between those who thrive and those who struggle.

1. Technological Transformation

- **Ultra-Connected World:** By 2050, nearly every device and system is interconnected through the "Internet of Everything." This creates hyper-efficient cities, but also exposes vulnerabilities to cyberattacks and system failures.
- **AI-Dominated Economy:** AI handles most labor-intensive jobs, from manufacturing to creative endeavors like writing, music, and art. Many humans pivot to roles that require emotional intelligence or cultural insight.
- **Bio-Enhanced Humanity:** Widespread use of genetic engineering, brain-computer interfaces, and cybernetic enhancements creates a new class of "augmented" individuals, sparking ethical debates over inequality and identity.

- **Advanced Materials:** Breakthroughs in materials science lead to ultra-light, super-strong structures, self-repairing materials, and nearly limitless energy storage capabilities.
-

2. Society and Inequality

- **Digital Feudalism:** The global economy is dominated by a few powerful tech corporations. Wealth inequality reaches unprecedented levels, with a small elite living in luxury while many others rely on Universal Basic Income (UBI) to survive.
 - **Urban vs. Rural Divide:** Futuristic megacities attract the majority of the population, offering advanced infrastructure, while rural areas struggle with underinvestment and slower technological adoption.
 - **Cultural Polarization:** Societies are deeply divided between technophiles who embrace transhumanism and traditionalists who resist it, creating cultural and political tensions.
 - **Migration and Climate Refugees:** Billions are displaced by climate change, flooding cities and straining resources. Some nations build heavily fortified borders, while others integrate migrants into innovative new communities.
-

3. Environmental Trade-offs

- **Climate Adaptation:** Despite efforts, global temperatures rise by 3–4°C, causing drastic changes to weather patterns, agricultural zones, and coastlines. Humanity shifts to a "managed survival" approach.
- **Geoengineering Projects:** Massive interventions, such as reflective aerosols in the atmosphere or artificial glaciers, mitigate the worst climate impacts but create unforeseen side effects.
- **Biodiversity Crisis:** Many species are extinct, and ecosystems are fundamentally altered. However, synthetic biology creates engineered ecosystems to fill some gaps in nature's balance.

- **Energy Paradox:** Fusion power becomes viable, but its development and distribution are monopolized by a few nations, exacerbating global inequalities.
-

4. Health and Human Enhancement

- **Radical Longevity:** The average lifespan extends to 120 years or more for those who can afford advanced medical care, thanks to genetic therapies, organ regeneration, and nanotechnology.
 - **Mental Health Epidemic:** While physical health improves, the pressures of living in a hyperconnected and competitive world lead to widespread mental health issues, exacerbated by social isolation from virtual reality overuse.
 - **Customizable Bodies:** Advances in genetic editing and prosthetics allow people to alter their appearance and abilities, leading to a blurred line between biological humans and engineered beings.
 - **Global Health Divide:** While affluent regions eradicate most diseases, poorer areas face declining healthcare due to resource constraints and climate-related challenges.
-

5. Space and the Cosmos

- **Space Habitats:** Permanent colonies exist on the Moon and Mars, but they are largely research-oriented and accessible only to the elite.
 - **Terraforming Begins:** Efforts to terraform Mars are in their infancy, with technologies developed to create artificial atmospheres and sustainable habitats.
 - **Asteroid Mining Boom:** Mining rare materials from asteroids fuels Earth's economy, but the profits are concentrated in the hands of a few powerful entities.
 - **Interstellar Exploration:** Advanced telescopes and probes begin studying nearby star systems for signs of life, but no definitive discoveries are made.
-

6. Geopolitics and Power Structures

- **Corporate Nations:** Large tech corporations effectively operate as sovereign entities, controlling resources, technology, and infrastructure in ways that rival traditional nation-states.
 - **Cold War 2.0:** A new geopolitical standoff emerges, with blocs led by AI-superpowers competing for technological dominance and scarce resources.
 - **Resource Wars:** Conflicts over water, arable land, and energy become common, often fought through proxies or hybrid warfare tactics.
 - **Global Governance:** International organizations gain more influence, but their authority is often undermined by regional disputes and corporate interference.
-

7. Culture and Identity

- **Digital Realities:** Many people spend more time in immersive virtual worlds than in the physical world. These virtual realities offer escape and opportunity but also foster addiction and disconnection.
 - **Post-Human Art:** Creativity is redefined as AI-generated art becomes indistinguishable from human-made works, challenging traditional notions of authorship and originality.
 - **Philosophical Rethinking:** As technology reshapes life, humanity grapples with existential questions about the meaning of identity, purpose, and progress.
 - **Cultural Fragmentation:** While globalization continues, hyper-personalized media and virtual spaces lead to fragmented cultural experiences, where individuals live in self-curated bubbles.
-

Conclusion

This version of 2050 portrays a world of extreme contrasts: breathtaking innovation and deep inequality, environmental resilience and collapse, human enhancement and existential crises. Humanity thrives in pockets of privilege but struggles to unite around common goals, creating a future where survival and prosperity depend heavily on where—and how—you live.

This image of the future is created with Gemini, as a possible image of the future.

The code of the image of the future: (2,1,3,4)

2050: The Symbiotic Age

Imagine a 2050 where humanity has finally learned to live in harmony with nature, not just sustainably, but symbiotically. We've moved beyond simply reducing our impact to actively collaborating with the planet.

Technology:

- **Living Architecture:** Buildings are grown, not built, using bio-engineering and living materials. They purify air and water, generate energy, and even produce food, seamlessly integrating with the natural environment.
- **Bio-computing:** Computers are no longer made of silicon but organic materials, mimicking the efficiency and complexity of the human brain. This allows for incredibly powerful and energy-efficient AI that can help us understand and interact with the natural world in new ways.
- **Genetic Adaptation:** Advances in genetic engineering allow humans to better adapt to changing environments. This could involve enhanced resilience to disease, the ability to thrive in extreme climates, or even the development of new senses to perceive the world around us.
- **Global Neural Network:** A planet-wide network connects not just humans but also plants and animals, allowing for unprecedented communication and understanding between species. Imagine a world where we can "talk" to trees or understand the needs of an entire ecosystem.

Society:

- **Eco-centrism:** Humanity has shifted from an anthropocentric worldview to an eco-centric one, recognizing the intrinsic value of all living things.
- **Collective Consciousness:** The global neural network fosters a sense of interconnectedness and empathy, breaking down barriers between individuals and cultures.
- **Rewilding the Planet:** Large-scale rewilding projects restore ecosystems and biodiversity, creating vast, interconnected wilderness areas.
- **Spiritual Renaissance:** A deeper understanding of our place within the natural world leads to a resurgence of spirituality and a renewed appreciation for the interconnectedness of all life.

This 2050 is a world of wonder and harmony, where technology enhances our connection to nature rather than separating us from it. It's a future where humanity has finally learned to live as part of the planet, not just on it.

What are your initial impressions of this symbiotic future? Is there any aspect you'd like to explore in more detail?

This image of the future is created with Deepseek, as a preferable image of the future.

The code of the image of the future: (3,3,1,2)

Certainly! Here's another vision of a preferable future in 2050, focusing on **human connection, creativity, and decentralized systems**:

A Decentralized and Empowering World

- **Localized Economies:** Communities thrive through decentralized, self-sustaining economies. Local production hubs, powered by renewable energy and 3D printing, meet most needs, reducing reliance on global supply chains. Artisans, farmers, and small businesses flourish, supported by cooperative models and digital platforms.
 - **Democratized Technology:** Open-source technologies and decentralized networks (like blockchain) empower individuals and communities. People have full control over their data, and digital tools are accessible to all, bridging the digital divide.
-

Human-Centered Innovation

- **Creative Renaissance:** With automation handling routine tasks, humanity experiences a cultural and creative explosion. Art, music, literature, and storytelling flourish as people have more time to explore their passions and collaborate across borders.
 - **Augmented Humanity:** Technology enhances human potential without replacing it. Brain-computer interfaces and wearable tech help people learn, create, and connect more deeply, but ethical safeguards ensure these tools are used to amplify human agency, not control it.
-

Regenerative Living

- **Symbiotic Cities:** Urban areas are designed to coexist harmoniously with nature. Buildings are covered in greenery, rooftops host gardens, and wildlife corridors run through cities. Urban farming and permaculture provide fresh, local food.
 - **Regenerative Agriculture:** Farming practices restore soil health, sequester carbon, and promote biodiversity. Farmers are celebrated as stewards of the land, and food systems prioritize nutrition, sustainability, and fairness.
-

Deep Human Connection

- **Community-Centric Living:** People prioritize relationships and community over individualism. Cohousing, shared spaces, and collaborative projects foster strong social bonds. Elders, children, and neighbors support one another, creating intergenerational solidarity.
 - **Global Empathy:** Advances in virtual reality and communication technologies allow people to experience life from others' perspectives, fostering empathy and understanding across cultures, religions, and ideologies.
-

Holistic Well-being

- **Integrative Health:** Healthcare focuses on prevention and holistic well-being, blending modern medicine with traditional practices. Mental, physical, and spiritual health are equally prioritized, and access to nature is recognized as essential for healing.
 - **Work-Life Harmony:** The concept of "work" has evolved. People engage in meaningful, flexible work that aligns with their values and passions. Leisure, family time, and personal growth are equally valued.
-

Ethical Governance

- **Participatory Democracy:** Citizens actively shape policies through decentralized, participatory systems. AI assists in decision-making by providing data-driven insights, but humans retain ultimate control, ensuring transparency and accountability.

- **Global Solidarity:** Nations have moved beyond competition, embracing cooperation to address shared challenges. Resources are distributed equitably, and global institutions prioritize peace, justice, and sustainability.
-

A Reimagined Relationship with Nature

- **Biophilic Design:** Cities and homes are designed to mimic natural ecosystems, blending seamlessly with the environment. People live in harmony with the rhythms of nature, fostering a deep sense of connection and respect.
 - **Reverence for Life:** Humanity has adopted a planetary ethic, recognizing the intrinsic value of all living beings. This shift in mindset has led to the protection of ecosystems and the end of exploitative practices.
-

In this future, humanity has redefined progress, prioritizing well-being, creativity, and connection over material consumption. Technology serves as a tool for empowerment, not control, and people live in harmony with each other and the planet. This world is not perfect, but it is deeply human, resilient, and full of hope.

Appendix 2. Summary in Finnish

”ChatGPT, kuvaile tulevaisuutta vuonna 2050.” Uskonnon ja sekulaarin pyhän representaatiot suurten kielimallien luomissa tulevaisuuskuviissa

Johdanto

Arjessa tulemme harvemmin miettineeksi mistä käsityksemme tulevaisuudesta ovat peräisin, mutta tästä huolimatta ne vaikuttavat olennaisesti toimintaamme ja siihen millaista tulevaisuutta ylipäätään tavoittelemme. Toistaiseksi tulevaisuutta ovat pohtineet ihmiset keskenään, mutta ChatGPT:n ja muiden suurten kielimallien kehityksen ansiosta myös tekoäly voi tänä päivänä osallistua keskusteluun tulevaisuudesta.

Tulevaisuutta koskeviin näkemyksiin liittyy olennaisesti se, millaiseksi näemme eri yhteisöjen, kulttuurien ja ilmiöiden merkityksen tulevaisuudessa. Tämä tutkimus tarkastelee erityisesti uskonnon roolia suurten kielimallien tulevaisuudenvisioissa. Uskonnot tässä kontekstissa kiinnostavan tutkimuskohteen tekee sen merkitys ihmisten identiteetille, sekä tätä merkitystä haastava oletus uskonnon merkityksen pienenemisestä tulevaisuudessa, joka on ainakin länsimaissa tavallinen.

Tähän oletukseen liittyen voimme asettaa hypoteesin tekoälyn tulevaisuuskuviin – eli vaihtoehtoisia tulevaisuuksia koskevien odotusten – sekularisoituneesta luonteesta. Hypoteesia tukevat aiempien tutkimusten havainnot ja suurten kielimallien kouluttamiseen käytettävien aineistojen tyypillisesti englantia puhuviin länsimaihin jäljitettävä alkuperä. Mikäli tekoälyohjelmien tulevaisuuskuvat todella ovat vinoutuneita länsimaisen sekulaarin maailmankuvan mukaisesti, voi keskustelu tulevaisuudesta tekoälyn kanssa saada toisenlaiseen taustaan kuuluvan henkilön tuntemaan, ettei hänen uskomuksilleen ole tulevaisuudessa tilaa.

Asennoituminen tekoälyohjelmia ja niiden tuottamia sisältöjä kohtaan on tutkimuksessa kriittinen ja kyseenalaistava. Suuriin kielimalleihin liittyy suuri potentiaali yhteiskunnallisten epäkohtien toistamiseen ja vahvistamiseen, mikäli näihin haasteisiin ei kiinnitetä tekoälyn ja sen käyttökohteiden arvioinnissa huomiota. Tästä huolimatta tekoäly voi olla joissain asioissa ihmistä parempi tai oikeudenmukaisempi, ja tekoälyn tulevaisuuskuvat voisivat teoriassa myös rikastaa omia käsityksiämme tulevaisuudesta.

Tutkimuskysymykset

Tutkimuksen tavoitteena on selvittää, millaisena suuret kielimallit esittävät uskonnon ja sekulaarin pyhän roolin tulevaisuudessa. Tässä tarkoituksessa hyödynnetään neljää tutkimuskysymystä:

1. Millaisia uskontoon ja sekulaariin pyhään liittyviä aiheita suurten kielimallien luomissa tulevaisuuskuvin on havaittavissa?
2. Miten nämä aiheet ovat representoituina tulevaisuuskuvin? Liittyykö representaatioon vinoumia tai esiintyvätkö jotkin aiheet ja teemat toisia useammin?
3. Onko suurten kielimallien luomien mahdollisten, todennäköisten ja toivottavien tulevaisuuskuvin välillä eroja uskonnon ja sekulaarin pyhän representaation suhteen?
4. Onko eri kielimallisovellusten välillä eroja uskonnon ja sekulaarin pyhän representaation suhteen?

Ensimmäiset kaksi kysymystä liittyvät analyysin eri vaiheisiin, representaatioiden havaitsemisesta niiden luokitteluun ja esiintyvyyden yleisyyden tarkasteluun. Jälkimmäiset kaksi kysymystä taas liittyvät analyysin jälkimmäisten vaiheiden vertailuihin eri kielimallien ja tulevaisuustyyppien välillä.

Aiempi tutkimus

Tutkimus sijoittuu uskontotieteen kentällä osaksi uskonnon ja tekoälyn tutkimuksen yhä muodostumassa olevaa tutkimusaluetta. Esimerkkiä on tutkimusasetelmaa suunnitellussa otettu myös kriittisen tekoälytutkimuksen, tulevaisuudentutkimuksen ja representaatioiden tutkimuksen parista. Etenkin tekoälyvinoumia tarkastelevien aiempien tutkimusten löydökset ovat osoittautuneet hyödyllisiksi, käsittelevät ne sitten uskontoa tai esimerkiksi kulttuuria yleisemmin.

Lähimpänä tämän tutkimuksen tarkkaa näkökulmaa on Anton Bergin (2024) väitöskirjatutkimus, jossa Berg tarkastelee uskonnon representaatiota tekoälypohjaisten kuvantunnistusohjelmien tekemisessä luokitteluissa. Vaikka kyseessä on eri teknologia, ovat monet löydökset tutkimusten välillä samankaltaisia. Toisena keskeisenä vertailukohtana on toiminut Kim Knottin, Elizabeth Poolen ja Teemu Tairan (2013) tutkimus uskontojen representaatiosta mediassa. Tutkijoiden löydökset ovat vain jossain määrin vertailukelpoisia tämän tutkimuksen kanssa,

mutta etenkin tutkimusmenetelmien valinnassa on heidän menettelytapoihinsa tutustumisesta ollut apua. Myös käsitepari ”uskonto ja sekulaari pyhä” on peräisin kyseisestä tutkimuksesta.

Teoreettinen viitekehys

Tutkimuksen teoriapohjaan kuuluu neljä keskeistä käsitettä tai näkökulmaa: kriittinen tulevaisuudentutkimus, tulevaisuuskuvat, representaatio ja tekoälyvinoumat. Kriittisen tulevaisuudentutkimuksen lähtökohdat kuten ajatus vaihtoehtoisista tulevaisuuksista taustoittavat ja motivoivat tutkimusta. Loput käsitteet ja niihin liittyvät teoriat tarjoavat työkaluja tekoälymallien luomien tulevaisuuskuviin käsittelemiseen.

Näiden pohjustavien teorioiden lisäksi uskonnon ja sekulaarin pyhän representaatioiden luokitteluun käytetyssä analyysikehikossa on hyödynnetty soveltuvia käsitteitä ja teorioita. Analyysiteemat perustuvat aineiston lisäksi olemassa olevaan tutkimuskirjallisuuteen, josta esimerkiksi teemojen alle sisältyvien aiheiden luokittelut ovat pitkälti peräisin. Joidenkin teemojen kuten transhumanismin kohdalla löytyy kirjallisuudesta melko vakiintunut määrittely niihin sisältyvistä aiheista, kun taas osan kohdalla rajanvetoa on täytynyt miettiä tarkemmin.

Tutkimusaineisto ja menetelmät

Tutkimuksen aineistona toimii 108 tekstimuotoisen tulevaisuuskuvan kokoelma, joka on muodostettu käyttäen kolmea eri suurta kielimallia: ChatGPT:tä, Geminiä ja Deepseekiä. Jokaisella kielimalliohjelmalla on siis muodostettu yhteensä 36 tulevaisuuskuva. Kielimalleja on kehoitettu kuvailemaan mahdollisia, todennäköisiä ja toivottavia tulevaisuuksia, 12 per kielimalli eli yhteensä 36 jokaista tulevaisuustyyppiä.

Tulevaisuuskuviin analysoimiseen on hyödynnetty laadullista sisällönanalyysiä sekä valikoituja tilastollisia menetelmiä. Sisällönanalyysin avulla on muodostettu kuusi teemaa, joihin uskonnon ja sekulaarin pyhän representaatiot aineistossa kuuluvat. Näiden teemojen esiintymistä tulevaisuuskuviin tarkastellaan aineistossa sekä yleisesti että vertaillen eri kielimalleihin ja tulevaisuustyyppeihin liittyvien tulevaisuuskuviin ryhmiä. Käytettyihin tilastollisiin menetelmiin kuuluvat yksinkertaisen vertailun lisäksi Pearsonin khiin neliö -testi, faktorianaalyysi sekä log-lineaarinen regressio.

Tulokset

Tutkimuksen keskeisimmät löydökset, joihin muut havainnot analyysissa pohjautuvat, ovat uskonnon ja sekulaarin pyhän representaatioista muodostetut kuusi teemaa. Nämä teemat

ovat: digitaalinen humanismi, sekulaari humanismi, transhumanismi, holistinen henkisyys, ekohenkisyys, sekä perinteinen kulttuuri & uskonto.

Listauksen järjestys perustuu teemojen yleisyyteen tulevaisuuskuvissa: esimerkiksi digitaalisen humanismin teema on representoituna yhteensä 87 tulevaisuuskuvassa, kun taas perinteinen kulttuuri & uskonto vain 38:ssa. Humanismi-termin esiintyminen kolmen yleisimmän teeman nimessä on osittain sattumaa, mutta se kuvastaa hyvin myös tulevaisuuskuvissa havaittujen representaatioiden läheistä suhdetta länsimaiseen humanistiseen perinteeseen.

Termi uskonto itsessään esiintyy 108 tulevaisuuskuvan aineistossa ainoastaan kolmesti, ja kristinuskon tai islamin kaltaisiin perinteisiin uskontoihin liittyvää sanastoa ei tekoälyn tuottamasta tutkimusaineistosta löydy laisinkaan. Sen sijaan yleisemmin henkisyydestä puhuvat kielimallit tulevaisuuden kontekstissa esimerkiksi mindfulnessin harjoittamisen tai ihmisten ja luonnon välisen yhteyden kokemisen kautta. Nämä havainnot viittaavat sekulaariin viinoumaan tulevaisuuskuvissa, joissa tänä päivänä länsimaissa nähtävät katsomukselliset ilmiöt ovat lähes ainoita, jotka tekoälyn mahdollisissa, todennäköisissä ja toivottavissa mainitaan.

Eri tulevaisuustyyppien välisiä eroja tarkastellessa havaitaan kuitenkin periaatteessa vastakkainen trendi: suhteessa mahdollisiin ja etenkin todennäköisiin tulevaisuuksiin, löytyy toivotavista tulevaisuuksista huomattavasti enemmän uskonnon ja sekulaarin pyhän representaatioita. Kiinnostavasti varsinkin henkisyyteen liittyvät teemat ovat keskimääräistä yleisempiä näissä kielimallien näkökulmasta toivottavissa tulevaisuuksissa. Vastaavia eroja on havaittavissa myös eri kielimallien välillä, esimerkiksi Geminin viitatessa useammin transhumanistiin ajatuksiin ja Deepseekin holistisen henkisyyden elementteihin. Nämä ovat kuitenkin eri tulevaisuustyyppien eroja pienempiä, ja pääosin kielimallien kuvailemat tulevaisuudet ovat yllättävän samankaltaisia.

Kuuden teeman välisiä suhteita tilastollisesti tarkastelemalla havaitaan, että läheisemmin henkisyyteen liittyvät teemat holistinen henkisyys, ekohenkisyys ja perinteinen kulttuuri & uskonto esiintyvät tavallisesti samoissa tulevaisuuskuvissa, kun taas transhumanismi-teema muita teemoja todennäköisemmin puuttuu näistä tulevaisuuskuvista. Tämä viittaa jonkinlaisen teknologia-henkisyys vastakkainasettelun olemassaoloon tekoälyn tulevaisuuskuvissa, mutta myös siihen että tulevaisuuskuvissa on erilaisia tyyppisiä ja toistuvia kaavoja. Jatkotarkastelussa havaitaan, että kielimallien tulevaisuuskuvissa tiettyjä teemojen yhdistelmiä ei esiinny lainkaan, kun taas jotkut yhdistelmät toistuvat parhaimmillaan 13 tulevaisuuskuvassa.

Johtopäätökset

Suurten kielimallien tulevaisuuskuviissa nähtävät uskonnon ja sekulaarin pyhän representaatiot vastaavat läheisesti aiempien tutkimusten löydöksiä tekoälyvinoumista ja länsimaisten ihmisten tulevaisuutta koskevista käsityksistä. Toisaalta yllättävää on kielimallien samankaltaisuus, sillä Deepseek on Kiinassa kehitettynä tekoälysovelluksena eri taustasta peräisin kuin yhdysvaltalaiset ChatGPT ja Gemini. Tulevaisuuksien kuvailun kontekstissa Kiinan valtiollinen sensuuri tai muut erot kielimallien kehityksessä eivät kuitenkaan ole näkyvissä – toki tilanne voisi olla toinen, jos malleilta kysyttäisiin tulevaisuudesta käyttäessä kiinan kieltä englannin sijaan.

Käytetyt tutkimusmenetelmät ovat soveltuneet hyvin suurten kielimallien tulevaisuutta koskevien yleisten käsitysten tarkastelemiseen, ja tutkimuksessa tehdyt valinnat on pyritty tekemään näkyviksi. Menetelmää voisi kuitenkin edelleen kehittää esimerkiksi analysoimisalla representaatioiden tarkkaa osuutta sanatasolla, tai vaihtoehtoisesti kielimalleilta voisi tiedustella suoraan uskonnon tulevaisuuteen liittyviä ajatuksia.

Tulevaisuuskuviin liittyy tavallisesti ajatus siitä, että ne ovat jonkin tietyn henkilön tai yhteisön käsityksiä tulevaisuudesta. Suurten kielimallien tulevaisuuskuviiden kohdalla voimme vastaavasti pohtia, kenen tulevaisuuskuvia ne vastaavat. Tämän tutkimuksen tulosten perusteella tekoälyn kuvailemat tulevaisuudet vastaavat länsimaiden valtaviiran sekulaareja oletuksia, mutta niissä on myös joitain painotuseroja suhteessa ihmisten kuvittelemiin tulevaisuuksiin. Mikäli tekoäly halutaan tuoda osalliseksi tulevaisuutta koskeviin keskusteluihin, olisi globaalissa mittakaavassa oikeudenmukaista huomioida nykyistä paremmin sekulaarien länsimaiden ulkopuoliset näkökulmat. Tulevat vuodet tulevat todennäköisesti näyttämään, kuinka tässä ja muissa tutkimuksissa esiin nostettuihin huoliin suhtaudutaan, ja miten tekoälytyökaluja tullaan käyttämään tulevaisuuden tai muiden aiheiden käsittelyssä.

Lähteet

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