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# Researching Artificial Intelligence Applications in Evangelical and Pentecostal/Charismatic Churches: Purity, Bible, and Mission as Driving Forces

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**Abstract:** We explore in this article how Evangelical and Pentecostal/Charismatic Churches (EPCCs) view Artificial Intelligence (AI), and how they use it, either intentionally or indirectly. Considering first the digital habitus in which EPCCs are immersed, we have documented and analyzed three sample cases showing how EPCCs use advanced AI tools to improve the sanctification process for believers; how the Bible can be translated, distributed, and its reading can be fostered around the world, using machine intelligence; and how a spiritual revival among EPCCs can spread rapidly through AI-mediated algorithms. We discuss the implications of these developments and conclude finally with some ideas about how EPCCs should engage AI applications in the future.

**Keywords:** digital religion; artificial intelligence; digital mission; digital Bible; revival; digital habitus; digital pornography detection

## 1. Introduction

The extent of the influence of artificial intelligence (AI) on a particular religious group depends on its beliefs and traditions. In other words, it is important to take into consideration the history of the religious group, the organizational structure, the evolution of its leadership, the principles and values, and the communicational aspects of its practices. Religious authorities, acting as gatekeepers, control the "strategic narratives communicated … about change, the purpose, and the value of AI" (Cheong 2021a). For this reason, it is important to study AI applications within the context of the religious group where it is intended to be used. In this paper, we turn our attention to the worldwide growing network of Evangelical and Pentecostal/Charismatic churches, where technological innovation has been embraced as part of their mandate of "make disciples of all the nations".

Although heterogeneous in practices and forms, Evangelicalism and Pentecostalism share history, doctrines, and ideals. Bringing these two branches of Protestantism together is risky but possible since we are witnessing a Pentecostalization and Charismatization of world Christianity without precedents, especially in the Global South (Kobylinski 2016). On one side, Evangelicals and Pentecostals share the belief in the Bebbington quadrilateral (Joustra 2019): the centrality of Christ's vicarious suffering on the cross for the salvation of humanity (crucicentrism), the authority of the Bible (biblicism), the need for a born-again conversion experience (coversionism), and a missional living out of the gospel (activism). However, Evangelicals and Pentecostals differ on the doctrine of Holy Spirit baptism and the acceptance of charismata or the manifestation of the Holy Spirit's gifts in today's church. The pneumatic spirituality of Pentecostalism is based on a five-fold expression of the gospel

which considers Jesus as savior, healer, sanctifier, Spirit-baptizer, and coming king. These two streams of Protestantism have been progressively brought together on a worldwide basis during the last 50 years, bringing renewal and unity of Protestant spirituality in terms of "scriptural reading, praise and worship, charismatic gifts, and personal and congregational reinvigoration" (Yong 2023).

Before exploring further, it is crucial to understand the key concepts related to AI technology. Artificial intelligence (AI) involves the development of machines programmed to perform tasks that typically require human intelligence. Instead of merely simulating human thought processes, AI relies on computational models and algorithms designed to analyze patterns, make predictions, and extract valuable insights from vast datasets (Russell and Norvig 2020). Based on the AI textbook by Russell and Norvig that covers the main topics and techniques of AI (Russell and Norvig 2020), AI can be defined as the science and engineering of creating systems that can perform tasks that require intelligence across various domains, by using methods that involve data, computation, and learning. From a computational standpoint, the ability to handle, analyze, and process vast sets of data far exceeds the capacity of a human being. Significant advancements in technology have played a pivotal role in this efficiency boost. Today, social networks generate millions of data points daily from different domains, serving as a valuable resource for AI systems. Given the vast volume of this data, it surpasses human processing capabilities. AI systems can be effectively programmed to handle this task on behalf of humans. Machine learning (ML) is a subset of AI that enables machines to learn and improve from experience without being explicitly programmed (Sarker 2021). Artificial Neural Networks (ANNs) are a key component of AI and ML. They are computational models inspired by the structure and function of the human brain and consist of interconnected nodes or "neurons" that process and transmit information (Guresen and Kayakutlu 2011). ANNs are capable of learning through training data already annotated or identified. Furthermore, Convolutional Neural Networks (CNN) are able to learn from data to identify the features of objects that are to be classified (Li et al. 2022). This last technology has allowed the development of generative models, such as generative adversarial networks (GANs) (Goodfellow et al. 2014). These models have the ability to generate new content, such as images, or entire virtual environments, by learning patterns from existing data. On the other hand, the Large Language Models (LLMs) (Brown et al. 2020) are also capable of generating new content, but they are specifically designed for natural language processing tasks[1]. The utilization of GANs and LLMs has contributed to the overhyping of AI capabilities. These concepts, which form the foundation of AI, are increasingly being explored and utilized in various domains, including religious communities, to enhance spiritual practices, facilitate communication, and engage believers in new and innovative ways.

After the COVID-19 pandemic, EPCCs maintained the digital spaces that had been created, developing a type of religious engagement where the digital overlaps and coexists as part of everyday spirituality, as another expression of Christian community (Campbell 2022). Alongside these innovations, new media and tools have been under development, in the form of apps for a variety of religious functions, virtual reality spaces, the adoption of AI-based social media platforms, and many novel products, platforms, and systems, which now incorporate machine intelligence as a non-negotiable part of their design. In the meantime, pastors, and leaders, who are digital natives, are starting to lead flocks of individuals who are also familiar with technology, finding out that a new mission field of "unreached digital tribes" is ripe for harvest (Korpi 2023). In the next section, we describe some relevant attitudes and justifications by EPCCs regarding the use of AI technology.

## 2. Christians and Digital Technology

After one of his massive technologically complex crusades, Billy Graham, the renowned North American evangelist, expressed: "We're not going to reach the whole world… but we're going to be the early forerunners of how it can be done technologically" (LATIMES 1995). These words represent an early theological justification for the massive embrace

of technology by Evangelicals and Pentecostals in later years. Graham gave technology a sacramental character because it allowed millions of people around the world access to God's grace. This is a reasoning that can be applied to new technologies that are emerging such as AI, as they "open new opportunities to encounter the divine" (Checketts 2021).

This sacramental justification has led to the development of an attitude that is a combination of hopefulness regarding the impact of these technologies in ministry, savvy entrepreneurship in their approach to the successful integration of technology within local churches and religious organizations, and pragmatism as the guiding principle for choosing, using, and deploying technologies, beyond traditionalism and denominational norms (Dyer 2023). Another dimension of this openness of churches towards innovation, creativity, and technology has to do with the constant desire of EPCCs to stay relevant in contemporary digital culture (Laughlin 2022).

Alberto Romele has defined digital habitus (Romele 2024, p. 118) as "a system of internalized schemes that generate all thoughts, actions, desires, and perceptions" within digital culture. In this sense, individuals are classified and clustered on terms of "preferences, tendencies, and expected behaviors", which means that all the actions and contents we produce online "can be datafied and hence analyzed" (p. 121). Individuals are represented by sets of data points or pixels that are available in the cloud and that can be processed further, using machine intelligence and more advanced generative models, to reinforce the digital habitus. According to Corrina Laughlin (2022), Christians have embraced this digital habitus by developing and extensively using digital technologies, bringing a drastic change to Evangelical and Pentecostal culture, something that is manifested in "new authorities, forms, and discourses" (p. 6). The digital habitus of these new digitized Evangelical and Pentecostal spiritual practices links technology with a conservative Christian worldview that emphasizes mission, scripture reading and prayer, holiness, well-being, prosperity, and other values, which are determined by the Christian entrepreneurs that create these novel products, embedding it in their designs and algorithmic choices. In other cases, the digital habitus imposed by large digital companies can be cleverly "reversed hacked" by Christians, to promote their spiritual practices, validate missional activities, and communicate teachings, prophetic words, and political ideas. Christian developers see themselves as "sheep among wolves" that need to be "as shrewd as snakes and as innocent as dove" (Mt. 10:16), such that algorithms can be strategically used for the expansion of the kingdom of God.

In eschatological terms, many EPCCs also see the advance in AI as a premonition of the end times, and as a facilitator of the apocalyptic destruction of humanity before Christ returns. Three aspects of the digital habitus combine to reinforce EPCCs eschatological hermeneutics based on Scripture. First, the expansion of the human capacity to organize and derive meaning from data is seen by Christians as a sign of the end[2]. Secondly, the disproportionate concentration of digital power in the hands of few entities could be the basis of a global government that controls humanity[3], because whoever owns databases for the training of AI algorithms has the power to attain global control (Hummel et al. 2021). Thirdly, the production of systematic and massive deceptions using computer graphics, sophisticated audio processing, virtual reality, algorithmic viralization of fake news, and the construction of fictitious identities using avatars, has stimulated apocalyptic interpretation. Thus, the emergence of a deceiving global leader, an antichrist[4], can be facilitated by the digital habitus and its associated technology. This dystopic narrative, where digital technology accelerates "social disintegration, violence, war and ultimate catastrophe" (Bendle 2005), has permeated EPCCs' prophetic imagination, where biology, hardware, and AI combine to bring about the destruction of humanity (Geraci 2008). However, despite the existing tension between the eschatological and the hopeful and pragmatic views of technology, EPCCs have continued following Graham's advice to use whatever means necessary to achieve the Christian mission in the world.

The accelerated datafication that the digital habitus creates (Romele 2020), transforms fundamental elements of church life such as the notion and understanding of the presence of God; the means of encounter; the channels of perception, and the emotions involved;

the spaces, places, and elements that facilitate God's presence; the human facilitators; and the response of the believers. Consequently, the classical models of encounter with God, that is (Tsatalbasidis 2019) Sacramental, by searching for God's presence; Kerygmatic, through hearing God's word; and Charismatic, through experiencing the gifts of the Spirit, suffer a dramatic change in our contemporary digital habitus. For some, as in the case of Haecker (2022), digital spaces and technologies provide a new infrastructure where "the performance of the sacraments is recalled and shared", and therefore computers and information and communication technologies can be considered "sacramental machines of the digital age". For EPCCs, especially for Pentecostals and Charismatics, a sacramental encounter with God is achieved through prayer, meditation, fasting, and worship music. The kerygmatic encounter is achieved through preaching and Bible study. The charismatic encounter is found in the exercise of the charismata, the fullness of the Spirit in everyday life, and through bodily and emotional manifestations of the Holy Spirit visitation, individually and communally. Given the availability of data and AI-based algorithms, EPCCs attempt to create intelligent software that replicates these models of encounter. In this article, we are especially interested in AI solutions that revolve around the elements of the Bebbington quadrilateral and the five-fold Pentecostal spirituality, which will allow some considerations and reflections to be drawn about the use of AI by EPCCs in the future. In particular, the search for holiness with the help of an intelligent system to control sinful drives; the use of big data to develop apps that keep the centrality of the Bible alive, helping to find meaning in scripture, giving tools for quoting it and creating viral messages with spiritual content; and digital strategies through social media that facilitate mission, by helping to find and reach out to what has been called unreached digital people groups (Korpi 2023).

## 3. Researching AI Applications in EPCCs through Case Studies

Christopher Helland has stated that digital religion goes beyond the packaging of liturgies into new digital media; instead, it is a careful conceptualization of the "societal and cultural components we associate with religion with the elements we associate with a digital society" (Helland 2016). In this regard, AI has become an important aspect of our digital society; however, the research about its progressive incorporation into spiritual practices is still in its infancy. This paper is an attempt to understand how EPCCs are involved in the conceptualization, development, promotion, distribution, and use of AI applications and solutions in their church life. To guide our research, the following threefold conceptual framework can be used to classify the interactions of EPCCs with this new technology (Zanoni 2021):

- *Religion in AI:* This refers to how EPCCs contribute to the design, development, and promotion of AI technologies that respond to their values, priorities, and practices.
- *AI in Religion:* This describes EPCCs interacting with existing AI technologies in their life and for their purposes.
- *Religion of AI:* This describes ways in which interpretations of AI technologies serve to project religious fears and beliefs, such as techno-dystopian prophecies based on the dispensationalist eschatological interpretations mentioned in the previous section.

A case study is an empirical inquiry that serves to investigate and understand a particular issue or phenomenon (Yin 2009). As a qualitative research strategy, exploratory case studies have been suggested as a methodology to explore and understand a new or understudied phenomenon or field, such as in our case, the potential impact of a new technology. From the analysis of the case studies, fresh research questions can be identified and used in future, more in-depth, research studies (Priya 2021).

In this article, we explore the use of AI in three cases that cover some cherished areas of EPCCs' spirituality: the search for personal holiness through sin avoidance, the centrality of the Bible in everyday life, and the expectancy of massive conversions and the visitation of the Holy Spirit by the diffusion or spiritual revival. The first two make reference to the *Religion in AI* aspect in the framework presented above, while the third corresponds to the *AI in Religion* aspect. We have chosen to study the development, implementation, and use

of these AI solutions because they represent the search for sanctification, biblicism, and the missional expansion of EPCCs as described by the Bebbington Evangelical quadrilateral and the five-fold Pentecostal spirituality mentioned before.

To understand these developments, a thorough review of published journal articles, books, web pages, blogs, and social media postings, was carried out to document the three cases. Since our research attempts to bring attention to the implications of AI algorithms, in each one of the cases analyzed we used the following case study questions wherever they were applicable: 1. What are the ecclesiological and missiological issues for which an AI application is proposed? 2. What are the AI technologies involved in the solution? 3. In which ways is the spiritual life of believers affected or transformed? 4. What new problems, for people and churches, are created by the deployment of the AI application? 5. What theological and social changes are involved in the adoption of the AI solution? 6. What groups and/or institutions gain power by adopting the AI application? Finally, based on the findings derived from the three cases, we attempt to show some of the questions and doubts that arise, which can serve as guides for further research projects, particularly ethnographic studies. Finally, based on the cases analyzed, some considerations about the future use of AI by EPCCs are suggested.

## 4. AI and Sexual Purity

Sexuality is a controversial topic in Evangelical and Pentecostal churches, especially because, while most fundamentalist groups withdraw from secular culture, Evangelicals and Pentecostals choose to engage in it, which means that they are exposed to digital sexual culture just like everyone else. EPCCs affirm that sex is blessed by God within the bounds of a married, monogamous, and heterosexual couple; anything else can be considered sinful and outside of God's plan for humanity (Burke 2016). Within this framework, pornography enters the category of adultery, based on Jesus' words regarding lust, found in Mathew 5:28, which can be paraphrased as "everyone who looks at a person with lust has already committed adultery in his/her heart". The problem for EPCCs is that today digital pornography is affordable, and explicit materials are available to all kinds of individuals interacting with a "seemingly unending supply of digital images and videos", readily accessible from the cloud through mobile devices, and originating from a vast and heterogeneous source of content creators (Ott 2022, p. 27). For that reason, many pastors and counselors have resorted to AI-based solutions to fight pornography addiction, which has been considered a major threat to the survival of Evangelical and Pentecostal churches (Perry 2019).

The idea of finding a technological solution to avoid the sexual sin induced by the vast amount of sexually explicit material available in digital space is not new and has evolved. From dedicated hardware filters, V-chips, and background scanning software, to sophisticated crowdsourcing methodologies, many entrepreneurs from different branches of conservative religious groups have attempted to create solutions to protect believers from exposure to indecent, violent, profane, and blasphemous media on the Internet (Feller and Ventimiglia 2021). The initial attempts were concerned with automatically editing movies or videos, but as the availability of digital material became more easily accessible, sophisticated, varied, and widespread, technologies had to be improved to cope with the task. In this way, Digital Pornography Detection (DPD) has been under development for the past 25 years, evolving from simple algorithms that block websites that are supposed to have this type of content, to methods of scanning hard drives in search of nudity, or web crawling and hash database applications to detect and block the dissemination of existing child exploitation images, to much more sophisticated approaches to monitor and track in real time the flows of newly created pornographic data on the Internet (Povedano Álvarez et al. 2023). In the digital habitus in which we are immersed, images, videos, and texts that have the capability of inducing sexual arousal come in different formats from a variety of digital sources such as dating apps; streaming sexual acts; chats; consuming commercial and non-commercial pornography; using virtual reality systems, and, more recently, relying on digitally controlled sex toys, or sex robots (de Bruin 2020). Thus, it seems plausible to reduce

digitized sexuality to a dataset composed of voxels, pixels, texts, commands, and sounds that can be analyzed and managed in real time using machine intelligence algorithms.

The key element for Digital Pornography Detection (DPD) is the automatic detection of digital pornographic images (Gehl et al. 2016). These algorithms follow the classical sequence of modeling, interpreting, calculating, classifying, and filtering. First, images are segmented by detecting the skin, using color and texture, and searching for large areas that could be sections of a naked part of the body. Then, these areas are modeled geometrically, to determine the body parts that they could represent, looking for faces, detecting the nipples and breasts, and identifying sexual organs, in particular female genitals. Several features are extracted from the segmented and modeled images, which are fed to a classifier based on machine intelligence to determine if the image or video can be labeled as pornographic material. In the case of videos, adding motion detection, analysis of sound information to recognize patterns of repetitive erotic sounds, and other cues, improves the detection of pornographic material. Most of the current detection systems use CNN to refine and improve the quality of the classification and detection systems.

The problem with this pattern recognition process is that it requires training against a database of annotated images. The curation of such a bank of images, containing all the variations in human anatomy and body characteristics, with annotations based on a vocabulary that covers all the possible linguistic descriptions and concepts regarding sexuality, is influenced by the worldview of those collecting and annotating them. If the database used is not carefully curated, in the end, the detection process will be biased, will lack transparency, and will be prone to errors, as Alexander Monea has stated:

> The datasets that serve as the foundation for the majority of computer vision applications in the world today are riddled with biases, most notably biases about sex, gender, and sexuality. These biases deeply impact how the machine learning algorithms trained on them operate and likely can never be adequately patched after the fact. Biased data will always produce biased results (Monea 2022).

DPD developers usually base their performance measures on larger databases such as ImageNet, which contains millions of annotated images used to train image recognition AI algorithms (Denton et al. 2021). This dataset has also been questioned, not only due to the way images were curated, usually by scraping them from websites without consent, but also how their annotation was crowdsourced to individuals geolocated all over the world, through the microtask platform Amazon Mechanical Turk. Moreover, it has been reported that some datasets include "images and text that grossly misrepresent groups such as women, embodies harmful stereotypes, overwhelmingly sexualize Black women, and fetishize Asian women" (Birhane et al. 2021). These are ethical issues that need attention, but they are overlooked by the urge to control the pornographic plague in EPCCs.

Driven by the mission of preventing sexual sin in EPCCs and helping to bring sobriety to those addicted to pornography, Christian entrepreneurs and programmers take for granted that a robust intelligent DPD can be designed with today's algorithmic tools and trained with the datasets available. However, for the popular Christian DPD software available, algorithms and validation processes are unknown, as well as the accuracy of the detection. As part of the computer-based sexual healing process, an additional level of digital accountability is added by most commercially available Christian products for DPD. Thus, the alleged addictive behaviors of the user, all his/her wanderings in digital spaces, credit card payments, and those suspected indecent images and videos blocked, can be tracked and reported to a "trusted" partner, a family member, a pastor, or a counselor. This combination of intelligent DPD algorithms and human intervention as a feedback loop is the road that most Christian developers have taken "to solve" such a complex issue.

The market for Christian AI-based sexual purity applications is growing, especially after their endorsement by politicians and celebrities. A recent report featured top products for the EPCCs market such as *Covenant Eyes* (CE), *Accountable2You*, and *Ever Accountable* (Mehrotra 2022). From this group, CE claims to be the first company with a machine-learning artificial intelligence solution to filter pornography, but there are several other

similar apps used in EPCCs, such as Fortify and Canopy. In particular, Canopy is based on Netspark technology, an Israeli company that filters images and indecent Internet content; it claims to have over 2 million users and covers 90% of the schools in Israel[5]. It is noteworthy that our search for independent studies on the Canopy app's efficacy proved inconclusive. No third-party studies were found, and the only available efficacy study was conducted internally by the company itself. The sole source of review identified was a positive one from TechRadar[6]. In the case of CE, some EPCCs, ministries, Christian NGOs, as well as Christian universities and colleges[7], have started to suggest their members download the app and start using it, to promote purity, somewhat expanding monitoring to all types of digital material (Perry 2019, p. 113). This type of surveillance is particularly worrisome in EPCCs known for their inclination to legalism and membership control, introducing a technology that could eventually produce abusive environments which could be very damaging, especially to LGBTQI+ Christians (Mehrotra 2022)[8].

### 5. Datafication of Bible Reading

A recent study (Faverio et al. 2023) found that 52% of the most religiously committed individuals use a digital Bible reading application. The written word of God is now digitized and represented by bits and bytes, contained in the cloud, transmitted through different media, encrypted, processed with numerical analysis algorithms, organized by database managing software, studied with AI tools, and shared massively, by chapters or portions, in all corners of the earth through intricate social networks, along with photographs, guides of study, devotionals, videos, GIFs, memes, hypertexts, etc. These new formats and channels lead Christians to rethink the concept of the presence of God in digital spaces and to consider the consequences of this new way of interacting with the Bible (Cheong 2021b).

The family of apps *YouVersion Bible App* dates back to 2008, when it started offering free online access to a digital version of the Bible, as a result of the efforts of Craig Groeschel, pastor of Life.Church (Edmond, Oklahoma) (Laughlin 2022). Later, Life.Church created an iPhone version, becoming one of the long-lasting applications available in the Apple Store[9]. Its popularity continued to grow steadily and by 2022, the number of installations of the application reached 547 million (Smietana 2023). The initial business model has remained, and YouVersion is still available for free to every user in the world. To secure funding, financial income streams are obtained from sponsors and donations from the users themselves. By the end of 2022, there were 2850 versions of the Bible written in 1900 languages, 1300 audio-recorded versions in 815 languages, and search support in 103 languages (Smietana 2023).

For Tim Hutchings (Hutchings 2017), YouVersion emphasizes two aspects to foster a culture of digital interaction with the Bible, accessibility and frequency of use. Accessibility is based on the growth of smartphone networks and the portability of devices. YouVersion has changed the material dimension of the Bible, making the scriptures available digitally to be consulted anywhere/anytime without the need of a physical book. With a persuasive and playful design that encourages frequent reading of short portions or individual verses of the Bible, using plans, reminders, suggestions, guided prayers, progress monitoring, and performance badges, the frequency of interaction is increased. The aim is that these readings are meaningful and transformative, progressively inducing changes in the lives of users. For the designers of YouVersion there is the conviction that in the process of transformation, God is present, near, accessible through his digitized word.

Thanks to this engagement with the app, a continuous stream of data is generated, which is analyzed to understand their reading habits. For example, the company measures the interaction with the application in each country in the world, finding results that guide decision making, such as engagement by country. For example, when comparing the third quarter of 2021 with that of 2022, the YouVersion team determined that, because of Ukrainian migration due to the war, interaction with the Bible in the Ukrainian language "skyrocketed" extraordinarily in several countries. Another measure is the most shared verse of the year, which in 2022 was Isaiah 41:10[10], which corroborated the confidence that the Bible brought in moments of great anxiety such as a war. YouVersion also employs

a collective database to store everything that the users are searching at any given time, which is analyzed using Google Cloud machine intelligence tools. This was useful during the beginning of the Russia–Ukraine war as searches in those languages multiplied. Data analysis and automatic translation made it possible to find Bible verses that best suited the users' needs (Google Cloud Events 2022).

According to Gregory et al. (2021), when a platform learns from the data that it collects, the AI capabilities are enhanced. In other words, a cycle of product improvement is started "where a user's utility of a platform is a function of the scale of data-driven learning and improvements realized with AI". This learning has led to new versions of the application that can be used on Google Home (GH), taking advantage of all the ML algorithms for voice recognition already existing in GH and blending it with YouVersion's Bible concordance searching. Another improvement is the *Bible Lens* application, which uses artificial vision techniques to analyze the content of a user's photo by detecting objects, backgrounds, colors, and other relevant aspects, to identify biblical themes associated with it. Next, the application correlates a relevant Bible verse and automatically creates an artistic representation of the chosen image that can then be shared by the user on social networks (YouVersion 2018). These uses of YouVersion increase the frequency of interaction, fostering the generation of new data that can be used to learn more about the users and their needs and interactions, adding more power to the ML algorithms.

For the first time in the history of Christianity, a massive amount of data is available about the Bible and its readers around the globe. This is a rather complex dynamic system involving YouVersion coders and their cultures, users and their cultures, and their situational contexts. Massimo Airoldi has suggested that in complex digital platforms, there is always a culture embedded in the code that represents "the culturally informed choices and goals of those in charge of programming and developing algorithms" (Airoldi 2022, p. 48). It is very likely that the technical team of Life.Church, besides being all Christian, has the classical composition of most technological start-ups, basically young white men, who also represent the values and contradictions of certain segments of USA Evangelical and Pentecostal culture. In particular, the company was started by a church influenced by the megachurch movement (Laughlin 2022) where a basic evangelical message of healing and prosperity (Bowler 2013), experiential and motivational faith, and cultural relevancy is preached. This is the culture embedded in the code, which is transmitted to the users through what Hutchings called a "procedural rhetoric" (Hutchings 2017).

Phillips (2018), has suggested that YouVersion tends to emphasize more "broadly therapeutic texts" instead of doctrinal ones or those with deeper theological connotations. However, this top-down ideological imposition does not operate without the agency of the users who provide the input learning data for ML algorithms which end up orchestrating reading suggestions. Phillips later discovered that there is a worldwide trend represented by "Jeremiah 29:11[11] overtaking John 3:16[12]" as the most representative verse of Christianity (Phillips 2020). In other words, prosperity seems to be "overtaking" salvation as the center of Christian life, creating some sort of filter bubble or echo chamber within YouVersion. This is what Airoldi has termed as the code embedded in culture (Airoldi 2022), which makes the interplay between platforms and users much more complex to understand, because persons are not passive and naive, and somehow influence algorithmic responses.

## 6. Machine Agency and Spiritual Revival

Many of the cases of the rapid expansion of Christianity can be related to "revivals", "awakenings", or "renewals" (McClymond 2016). A revival can be seen as a new spiritual impulse for churches whose message seems to be dry, exhausted, and disengaged from society. Expectation of revival is part of the EPCCs culture with an insistence on continuous 24/7 prayer to stir up an awakening, a language and theology about revival, and their public expression of an intense spirituality and the demonstration of spiritual power as signs of the awakening (Hunt 2020). However, embedded in the spirituality of renewal

movements there are technological elements that are not usually considered as contributors to the spreading of these revival fires.

On 8 February 2023, reports of an "outpouring" of the Holy Spirit at Asbury University (Wilmore, Kentucky) began to appear on social media (SojournerFilms 2023). This resulted in a religious service that continued indefinitely for days, until the university authorities decided that it had to stop for logistic and academic reasons, after 372 h of praise, prayers, short messages, times of quietness and reflection (Elliot 2023). What drew powerful attention was the number of downloads on the TikTok platform, of short videos created by students at the university and by the thousands of visitors who had gone to the place, in just 16 days of revival. One week after the start, videos on TikTok with the hashtag #asburyrevival had been viewed 24.4 million times (Traylor 2023). Then, by Tuesday, 21 February, views had topped 90.3 million, with the first video in the list surpassing 1.3 million downloads. By 5 March 2023, after the revival was canceled, TikTok videos with the #asburyrevival tag had reached 127 million downloads[13]. Meanwhile, attendance to the services on campus started to grow, attracting more than 50,000 visitors (Elliot 2023).

Revivals do not reproduce easily within the hierarchical structures of denominations; instead, they seek alternative, less predictable, and to some extent chaotic paths, where social networks play a fundamental role. Within the EPCCs' optimistic logic towards technology, digital social networks have been seen as catalysts of a spiritual awakening among digital natives, imagining relationships, connection building, and content creation, in a linear fashion. However, in today's digital habitus, it is no longer possible to consider social networking without addressing the complex interconnection between "people, code, and context" (Bucher 2018, p. 7). *Machine agency* has become a fundamental piece of social media platforms, provoking a revolutionary change in the understanding of digital social networks (Kang and Chen 2022). In these platforms, "user agency and machine agency interact and co-create user experiences" (Kang and Chen 2022, p. 1), allowing learning about the users, personalizing content, providing AI-based editing tools, offering recommendations, and helping to expand users' networks.

This is the case of TikTok, a social media application that is mainly used to produce, publish, and share short-form videos ranging from fifteen seconds to three minutes created on mobile devices, with the mission statement to "allow everyone to be a creator". Currently, 63% of its members are young people between 18 and 34 years of age (Millennials and Gen Z). In TikTok, all uploaded videos can be seen, since the algorithm offers them to potential users that show similar interests. So, a young creator can become popular without even having followers, making the platform exceptionally useful for making viral videos. Additionally, all content can be shared on other social media platforms, increasing the potentially reachable audience. Likewise, videos can be remixed with other media elements, which gives each content greater usefulness.

TikTok has been considered as addictive, superficial, lacking depth, pure entertainment, distractive, and thus its characteristics have been downplayed, but it has become part of everyday life for young people, not simply a "random and short-lived entertainment" (Schellewald 2021), but a place where they can "self-fashion identity, form supportive digital communities, and exert agency" (Boffone 2022, p. 5). TikTok provides the affordances for Gen Z to express themselves, find belonging, have awareness about the life of others, encourage collective agency, show solidarity to traumatic events and mental issues, but at the same time serves to portray themselves "as a generation of contrasts: powerful and self-assured, yet vulnerable and damaged... underestimated, unseen, and antagonized by older generations" (Cheng Stahl and Literat 2023, pp. 941–42). At least in the United States, 34% of Gen Z (born between 1997 and 2012) are not affiliated with any church, and 19% of them consider themselves atheists or agnostics (Cox 2022). Consequently, a new global culture of Christian tiktokers has been under development, redefining evangelism, and expectant of a digital "move of God" or revival.

In every social network, there are nodes called strong ties that maintain a close relationship of regular contact. There are also weak ties that are distant, geographically, or socially.

During the digital spread of revivals, this dynamic meshing between strong and weak ties plays a fundamental role as each machine learning algorithm treats them differently. The machine agency of TikTok facilitates creating and sharing content, as well as networking, providing access to weak ties by following other content creators with similar interests. In a social network, if those nodes, susceptible to being influenced by innovations such as a spiritual revival (vulnerable nodes), are linked together, form what is known as a percolation group, which constitutes the channel through which the renewal impulse flows, producing a cascade effect that accelerates the spread of religious ideas (Collar 2013).

In the case of TikTok, vulnerable nodes can be algorithmically connected by employing a feature called "For You Page" (FYP) which is based on an AI algorithm for content curation that considers what is watched, shared, liked, and followed by the user. The content displayed on FYP is not chosen by the user, but it is decided by an algorithm that understands their interests, and which also connects "users with the broader cultural dynamics unfolding on the platform" (Schellewald 2021). Despite the brevity and short life of the video, and the fast pace of the continuous offering, the first impression that it produces on the user sets the mathematical models of the platform to find a new video that will closely adjust to the user's preferences (Wall Street Journal 2021). This fast-paced, short video watching is the reason why TikTok is "a place where new trends continuously emerge" (Schellewald 2021). Moreover, the AI curation algorithm does its job in such an accurate way, in terms of timing and content, that the users feel so comfortable with the videos proposed, arriving in some cases at the conclusion that what they are seeing is not just the result of "a finely tuned algorithm designed to predict which videos will seize and sustain their attention, but perhaps divine intervention" (Cotter et al. 2022), something that can be illustrated through a comment on a YouTube documentary describing those days of the Asbury revival:

> "I was browsing TikTok, minding my own business, and an Asbury Revival clip showed up. I was beautifully wrecked by the Holy Spirit. I was a lost sheep but now I'm in my Shepperd's arms again" (@acdeleon134, comment on YouTube video, (SojournerFilms 2023)).

## 7. Discussion and Conclusions

In this article, we have shown through three different cases how EPCCs are proactively involved in the exegesis, adoption and adaptation, creation, use, and shaping of AI-based technologies. In the first place, it is possible to affirm that the engagement of EPCCs with AI algorithms has similar characteristics and problems to what can be found in other fields. After reviewing the hopeful, entrepreneurial, and pragmatic views of technology by EPCCs, we have shown how the weight of dispensationalist's interpretations of Bible passages tend to understand AI as a facilitator of a new world order ruled by the Antichrist, and its current developments as premonitory of the end times, representing a form of *Religion of AI*. Despite this, in the second place, as a form of *Religion in AI*, we have documented two cases where products aimed at helping to strengthen the devotional life and the sanctification process of believers have been developed and distributed by EPCCs entrepreneurs. Finally, in an example of *AI in Religion*, we have shown how a recent spiritual revival has spread due to the use of digital social media, and this diffusion has been amplified by the machine agency of social media platforms such as TikTok.

In the case of intelligent apps for sexual accountability, there is a need for further research, particularly on the real value of this approach in the lives of believers struggling with pornography addiction. To the best of our knowledge, there has not been any serious study on the benefits of this approach. On a more technical side, the origin and characteristics of the training data for the DPD's of the currently available AI solutions remain unknown. This raises questions regarding biases in terms of gender (algorithms may be tuned up to detect mostly female nudity), race (the biasing of skin detection algorithms), and culture (understanding and acceptance of nudity varies from culture to culture), but also, from a Christian ethics standpoint, how, and from where, these training images were obtained, how they were annotated (the linguistic descriptions and concepts about sexuality

used), and by whom (crowdsourcing using people performing micro-tasks assigned by software engines). Another concern is the use of these apps as a surveillance tool by EPCCs and other Christian entities, which can impact vulnerable LGBTQI+ believers. Finally, there are already machine-intelligent engines that produce adversarial pornographic material that does not trigger the alarms (Monea 2022), which leads Christian companies to have to retrain their models continuously.

In the case of YouVersion, we observed that there is a massive amount of digital data available about the Bible, represented by thousands of versions, translations, studies–commentaries–plans, information about the reading habits of users, and trending topics, especially during certain critical situations. We also noted that the platform is not free from bias due to the worldview of the developers, but also because the Christian audience that it reaches around the world has seen an overwhelming shift in their beliefs to a more homogeneous acceptance of prosperity theology (Bowler 2013), or healing and therapeutic uses of scripture. In other words, the most popular passages read are those that "encourage and motivate social media users, and which fit well into the therapeutic sharing culture of the internet" (Phillips 2020, p. 111). The result is a drastic change in how the Bible is read in our current digital society. It is a fragmented reading, with small portions that fit personal preferences, in a format that can be shared on different social media platforms, that emphasizes well-being, healing, prosperity, multimedia (visual/auditive) pathways, storytelling, and expansive Christianity, and the reading takes place out of the context of a church community, and the authority is distributed among thousands of contributors on the platform (Weaver 2017). The large database collected by YouVersion opens the possibility for the use of generative models in the near future, and for numerous projects involving machine learning algorithms.

In the case of the Asbury revival, we have shown how the machine agency of TikTok was another factor contributing to the spread of the outpouring, particularly among Gen Zs. The fact that the Asbury revival generated so many video views on TikTok was considered surprising by EPCCs because a vast majority of the platform's users belong to Gen Z. During the pandemic, while TikTok was experiencing a massive growth, Gen Zs were spending less time in face-to-face contact with others, and their mental health was being affected, showing feelings of insecurity and uncertainty about the future, but also growing in terms of "self-enhancement, openness to change, and novelty" (Harari et al. 2022). In a way, Gen Zs Christian tiktokers and spiritual seekers were ripe for a digitally driven awakening such as the one experienced in Asbury. For EPCCs, revival is spread through the agency of the Holy Spirit and the agency of people sharing the message and charisma of the outpouring. However, for the Asbury revival and for others that will come, machine agency will have to be considered and incorporated into the theological explanations.

The cases documented are just a small sample of how EPCCs are engaging with AI technology. They cover the biblicism, healing and sanctification, and activism efforts of EPCCs, providing a glimpse of the digital habitus of Evangelical and Pentecostal Christians. In this regard, a deeper conversation should be started regarding the ethical aspects of these and other developments such that they meet the requirements to be considered trustworthy AI applications. In 2019, the document entitled "Artificial Intelligence: An Evangelical Statement of Principles" (ERLC 2019) was published. The document expressed concerns about the possibilities of bias and of unethical data collection practices in AI-based applications, adding that "data should not be mishandled, misused, or abused for sinful purposes to reinforce bias, strengthen the powerful, or demean the weak". The document emphasizes that the church plays "a unique role in proclaiming human dignity for all and calling for the humane use of AI in all aspects of society". In this sense, due to the possible deeply intimate personal characteristics of the use of AI in religion, it would be interesting for EPCCs to also consider the proposed European Union Artificial Intelligence Act which has explicit prohibitions on AI systems that (AL 2023, p. Title II, Article 5): "deploy subliminal techniques to distort a person's behavior; exploit the vulnerabilities of specific groups of persons due to their age, physical or mental disability, to distort their

behavior; and evaluate or classify the trustworthiness of persons based on their social behavior or known or predicted personal or personality characteristics".

## Notes

1. GPT-3 and GPT-4 are LLMs used recently by chatGPT, chatPDF, Bart, Bing and all the most recent chatboots created.
2. Daniel 12:4.
3. Revelation 13:16–17.
4. Revelation 13:15.
5. https://www.netsparkmobile.com, accessed on 10 Febrary 2024.
6. TechRadar is an organization that dedicates hours to testing each product or service before reviewing them, https://www.techradar.com/reviews/canopy, accessed on 10 Febrary 2024.
7. Bob Jones University recommendations for the use of CE can be found here: https://t.ly/zURxo, accessed on 10 Febrary 2024.
8. There is also concern about the use of CE to surveil people on parole by some US courts. See: Mehrotra, Dhruv (2023) "An Anti-Porn App Put Him in Jail and His Family under surveillance", Wired, Jun 12, https://t.ly/7V0IC (last visit 24 January 2024).
9. It was downloaded 180,000 times during the first 20 days after the opening of the Apple Store.
10. "Do not be afraid, for I am with you; do not be distressed, for I am your God... I will strengthen you and help you; I will uphold you with my victorious right hand".
11. For I know the plans I have for you, "declares the LORD", plans to prosper you and not to harm you, plans to give you hope and a future.
12. For God so loved the world that he gave his one and only Son, that whoever believes in him shall not perish but have eternal life.
13. https://www.tiktok.com/tag/asburyrevival?lang=en, accessed on 10 Febrary 2024.

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