

Computers and Religion

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Abstract — Religion is a key social structure in many societies, and the development of religion can be traced thousands of years back. While computing technology is new, it has been used extensively for religious propagation and religious reasons. Computers have also been extensively shaped by religion, from both real and science-fiction standpoints. Recently, religion has gained traction in computing with the introduction of virtual artificial intelligence. The moral and ethical structures that are set by many religions have influenced the way that artificial intelligence interacts with humans, and how it will interact with humans in the future. The future of computers and religion will offer more tests to religion and ethical beliefs, as well as more ways that people can express religious beliefs through technology.

Keywords—computers, religion, background, future, artificial intelligence, cyber faith, multiculturalism, computing, languages

I. INTRODUCTION

Religion has been an important social structure in almost all past and present societies. The development of religion can be traced thousands of years back. Religion is a cultural system of designated behaviors and practices, views, places, ethics, or organizations, that relate humanity to the supernatural or transcendental entities.

However, with the onset of modernisation and scientific revolutions, some aspects of religion have been criticized. This has led to a divide between the scientific community and the religious community. Although, it must be noted that there exists much overlap between the fields of religion and science. In particular, the field of computing and computer science has been used extensively for religious propagation and religious reasons.

It is also a field which benefited greatly by incorporating itself into areas where religion allows for different viewpoints on solving particular problems, allowing for more solutions to come from developers. Computers have also been extensively shaped by religion, from both real and science-fiction standpoints.

Recently, religion has gained traction in computing with the introduction of virtual artificial intelligence. The moral and ethical structures that are set by many religions have influenced the way that artificial intelligence interacts with humans, and how it will interact in the future.

The future of computers and religion will offer more tests to religion and ethical beliefs, as well as more ways that people can express religious beliefs through technology.

II. HISTORY OF RELIGION AND TECHNOLOGY

Advances in technology have been historically used to help spread religion. The means and methods of proliferating religion have changed with the introduction of technology. The most influential methods were: (A) The printing press, (B) radio communication, (C) Television, and (D) Computers and the Internet.

A. The Printing Press (circa 1440)

Around 1440, German inventor Johannes Gutenberg created the printing press, based on existing screw presses. His goldsmithing experience allowed him to develop a printing system of metal movable type in large quantities. This drastically reduced the cost of printing books and other documents, and allowed for quicker production of a large quantity of printed material.

The invention of the printing press introduced the era of mass communication. Given the influence that the church held in Western Europe at the time [1], not only was the first book printed by Gutenberg's press the Bible, but also a great deal of the early printed works was of religious nature. The increased literacy rates that came with the invention and the prevalence of religious texts resulted in a growing subsection of the European public with direct access to religious materials.

B. Radio (1920s)

The earliest use of the radio to disseminate religious information was on January 2nd, 1921 [2]. Reverend Edwin J. Van Etten, Rector of Calvary Episcopal Church in Pittsburgh, broadcast a full church sermon via the KDKA station. Although the broadcast was originally meant to be an experiment, the impact of the broadcast was much more immense than Van Etten theorized. This showed that religion was able to take advantage of modern advances in technology, which, as seen before with the printing press, the result of the combination allowed for more people to have access to religious materials and the religious experience of broadcasted sermons.

Later, national and local sectarian organizations would receive free air-time for producing content regarding religion.

C. Television (1950s)

Religious programs have been a fixture of television from its earliest years. Consistent with traditions developed in the radio era, there have been a variety of religious programs broadcast on television. In the United States, most early religious television programs were produced by national councils of churches and conventions [2], until a change in laws allowed for the use of domestic satellites to create alternative television networks.

This became known as *Televangelism*, which was capitalized upon by various organizations outside of the religious mainstream. These programs gained traction from the mid-1970s onward, and would gather much smaller, niche audiences compared to their megalithic counterparts.

D. Computers and Internet

As with previous technological advances, religion and religious organizations were quickly able to take advantage of the emergence of computers and the internet. As personal computers became more widely available to families, new fields of religious entertainment emerged, such as interactive software and video games.

Religions are represented in the Internet in many ways. There are sites which attempt to cover all religions, traditions, and faiths, while other are specific to a religion. Other websites were set up to offer theological debates and advice. Through the internet, people can now connect with each other and participate in virtual prayer, meditation, and pilgrimages. [4]

III. IMPACT OF COMPUTERS AND RELIGION ON SOCIETY

With the introduction of computers and the internet, religion quickly adapted to take advantage of the mediums. As religion has been a cornerstone of almost every society in the past, it is not a surprise that it is still highly prevalent in the modern world.

A. Technological influence

Religion has had a great deal of influence on computers and how we access information. Many current technologies and software has some sort of insight that can be derived from religious influence. For example, *Intelligent information marketing* allows information to reach a targeted user group based on specified demographic parameters. The dissemination of religion has, historically, been a test of marketing strategy to appeal the ideals and tenets to the masses. Particularly, intelligent information marketing is used by various religious organizations to spread their message to niches, which helps them secure a strong following within that niche group.

Multimedia communication, which gained more popularity via the use of the internet, has had a great deal to do with religion. Communication methods prior to the use of computers were mostly verbal or textual, with considerable effort required to create images and illustrations. Computer software such as Adobe Photoshop and Illustrator, along with word processors such as Microsoft word, were quickly adopted by users to engage target audiences and help communicate certain messages better. The task of typesetting, designing, and editing

various media became much more manageable using computers. Also, the fact that this media could be distributed quickly and reliably via methods such as chat, social media, and email, meant that the distributed media had a greater chance of making a meaningful impact on the users. Religious messages were much easier to communicate, and hence, multimedia communication became a much more prominent method of communication religious information [5].

The internet and networking were another major step in helping religions create a bigger impact on society. The ability to communicate with others quickly and reliably meant that religion could be spread and discussed using the internet. The main methods employed here were online information meccas, discussion forums, and integration with physical institutions, such as churches and synagogues.

Many online websites were set up to deliver information about religions. Websites focusing on cataloguing many religions, such as Patheos, Religious Tolerance, and BeliefNet, became popular ways to gain information and insight in the inner workings of various religions. Other websites focused on one religion, such as Christianity or Buddhism, and were created along with a forum or some method of community communication in hopes of replacing the more traditional brick-and-mortar religious institutions that existed physically [6].

Many ministries began posting informational and sermon-like messages to visitors. Through the years this method of teaching has evolved in the form of video, audio podcasts and blogs.

Several attempts to provide a virtual religious experience were made. A popular online virtual community known as the Church of Fools, offered church experiences through entirely 3D virtual reality environments. The online church was criticized by a variety of ministries, as it did not provide a “human connection”, which was part of the religious church experience [7].

Advances in Human-computer interaction allowed for a variety of experimentation on strengthening religious bonds with people. With the advent of virtual reality, people could attend virtual sermons and service from the comfort of their home. This was more attractive to younger people, as churches began to lose 70% of their young audience in attendance [8]. Within virtual worlds, people would not only communicate with each other, but also have the “human connection” of attending the event. Various methods of removing the barrier of keyboard and mouse from the interaction between humans and computers have pushed for a field of experimental religious communication.

B. Religious Entertainment and Software

It is not uncommon to see religion being spread via engaging texts and stories. Heck, most religious texts engage the reader through a compelling and emotionally provoking narrative, to persuade them of the ideals and mores of the religion. Advances in technology have made it much easier to create engaging and informative pieces for audiences.

To understand the influence of religion in video games, the idea of religious elements must be defined. Organized religions and be cultural systems, with corresponding behavior and practice. They often have sacred texts and holy places. A religious experience, however, does not necessarily have to be understood through a religious framework. Other themes, such as life and death, are existential in nature, and although not immediately understood as religious, they often allude to religious concepts.

Video games, whether **explicitly** or **implicitly**, have often contained religious themes:

- *Explicit references* make it clear what the reference is, such as referring to a real-world or fictitious religion. Games such as *Age of Mythology* and *Prince of Persia* have both referred to real-world religions, and allowed the player to explore the in-game versions [9].
- *Implicit references* often refer to religion via existential and spiritual feelings that the player makes on his journey inside of the video game. This can be seen in virtual communities such as *World of Warcraft*, where people often hold ceremonies such as weddings and funerals with their virtual characters to observe events that happen in real life [10].

With religious themes seen in various games, the field of religious virtual entertainment gained traction through the releases of themed video games, where the primary goal was to promote the religion. One such example is a series of Christian themed video games for the Nintendo NES system known as *Bible Adventures*. Several standards set in place by Nintendo and United States prohibited excessive religious themes in video games, so the game was released unofficially, without Nintendo's approval. Due to the poor reception of Christian-themed video games, religious entertainment gained notoriety within the general populace [11].

Besides video games, other software has been developed with religious themes. Operating Systems such as TempleOS, Ubuntuce, Bodhi Linux, and Sabily have entered the operating system market with the promise of religious enlightenment. However, rather than providing a wholesome religious experience, the listed operating systems were simply shallow attempts at trying to appeal an OS to a religious audience [12].

C. Multicultural Environments

Computer technology and engineering creates a universal language. Technology draws on expertise based around the world. It is not uncommon to have engineers from various languages, cultures and religions working together on projects, as well as designing for markets different from their own backgrounds. By understanding different religions and cultures, engineers can be sensitive to other markets' cultural norms, as well as those of fellow colleagues [13].

D. Virtual Worlds

Religion has also indirectly influenced the language of computing as well. An example is the popular "avatar", the representation of a user of virtual reality such as a computer role-playing game or a virtual community.

In Hindu philosophy, an avatar commonly refers to the incarnation of a higher being or the Supreme Being onto planet Earth. The term is used primarily in Hinduism for incarnations of Vishnu, whom many Hindus worship as God. [14]

Today the word "avatar" has gone from meaning a bodily manifestation of a god to the bodily manifestation, or incarnation, of an entity not oneself, while being used all the time in social networks and virtual reality software [15].

The use of virtual avatars is commonplace today. Snapchat, a popular communication app, has released the app "BitMoji", which allows users to create virtual avatars which can resemble the user. The avatars can then be used to communicate with friends and express the feelings and emotion that the user sets within the application [16].

E. Accessibility

Advances in computing technology and Human-Computer interaction have taken into account the accessibility of computerized information. *Accessibility*, in this case, refers to the design of software and content for people that experience disabilities. The concept of accessible design and practice of accessible development ensures both direct unassisted access and indirect access to the content via an assistive device (such as a screen reader).

Special guidelines that are set up by associations such as W3C help shape the current state of the web. This set of standards allows developers of both content and assistive devices to work together harmoniously in order to create a good user experience for most users [17].

IV. ASSESSING THE IMPACT

The impact that Computers and Religion have had on society has been both good and bad. In terms of advancing communication and accessibility, the impact has been mostly positive. However, the combination of computers and religion have raised multiple ethical questions that were previously not present.

A. Accessible Content

Traditionally, religion was spread via word-of-mouth or through traditional methods such as books and scriptures. However, with the advent of technology, religious information became more accessible to the public.

When computers emerged, the field of human-computer interaction began to take into account the way that disabled individuals interact with computers, causing a shift in the way that software and hardware was designed. This was important since one of the key features of robust software became accessibility options, or at least the ability to integrate assistive devices [18].

A greater amount of the world's population was therefore able to access content and applications, regardless of disabilities. This, in turn, was used by many religious organizations to help spread their messages and ideals, which went in line with the original aims of spreading religion that have been practiced since religion existed.

Defining *accessibility* as ease-of-access, however, we see another benefit of the introduction of computers in the field of religion. In particular, decreasing storage costs and emergence of data preservation organizations has made it much easier to access and document all sorts of information. Historical texts could now be digitized and preserved in a format that does not degrade or lose usability over time, as digital data could be migrated to other places, copied, and decentralized in order to prevent loss of information [19].

With more data being accessible, Religious information can be referenced by more individuals than prior possible, and important historical documents are now digitized and allow an even longer preservation compared to traditional methods.

It must be noted, however, that due to the large amount of data that is being stored, it becomes more difficult to ingest the sheer size of available data, and to counteract this, many agencies and organizations have resorted to curating specific content with the ability to refer to other sources for other information (such as this paper) [20].

B. Forums and virtual communities

Online forums, message boards, and newsgroups have become commonplace. Communication tools such as these offer many strong benefits to their users. However, forum participation can also become a destructive addiction, where the benefits are overshadowed by negative side effects.

Traditional face-to-face communication can be evaluated using the following equation:

$$38\% \text{ vocal} + 7\% \text{ verbal} + 55\% \text{ body} = \text{message} \quad (1)$$

The model for this equation states that only 7% of the communicated message is the actual words spoken, while the rest of the message relies heavily on the intonation and non-verbal communication. When this equation is applied to online forums, the vast majority of the communication “verbal”, or the actual words that make up the message. Although non-textual meaning can often be inferred from the text, purely-textual communication becomes more objective in conveying its meaning [21].

Online communication forums, especially those that cover religious topics, have a variety of positive benefits:

- They are positively linked to well-being for stigmatised group members.
- Online discussion forum use is linked to offline civic engagement in related areas.
- Identification with other forum users mediates the above relationships.

It must also be noted that such forums can also become a breeding ground of false information and religion-based terrorism. For example, multiple forums set up by Islamic State members have been used as recruiting grounds and planning bases for terrorist attacks. Recently, Islamic State members have been using online social networks such as Twitter to

disseminate information and claim terrorist attacks worldwide [22].

C. Uniting Computer Enthusiasts

The ability of computers to unite individuals to work on software and hardware projects has been nothing short of spectacular. It has presented humans with an almost “universal” language, to the point where multiple individuals, regardless of religious, ethnic, or regional background, can contribute to projects that require a knowledge of a common programming language. By overcoming the hurdles of different religious backgrounds, computers have had a **positive** impact on helping people come together to work toward a certain goal.

D. Ethical Issues

The combination of computers and religion has given birth to a new series of ethical issues surrounding humanity. This is partially due to the fact that computers and religion individually have a set of ethical issues that humanity must address, and the combination of both spurs further issues.

Several issues regarding the field have come to light in recent times [23]:

- What are the implications to designing video games focused on killing or oppressing?
- What are the implications of publishing a website that presents one religion as superior to others?
- Does blending human and machine improve quality of life?
- Is it ethical to replace aspects human life with digitized ones?
- Is it ethical to displace human workers by employing computers and machines?
- Does our ability to create virtual “life” make us virtual “gods?”

It must be noted that this list of ethical issues is constantly evolving, just as the fields of computing and computer science are. New ethical dilemmas that involve a religious background spring up every day, and it is up to humanity to discover the correct resolution to such issues.

V. FUTURE OF COMPUTERS AND RELIGION

Religion and Computers have become integrated to the point where old religious infrastructure is having trouble keeping up with modern incorporations of technological religion. This is getting more and more visible through the installation of web-based cyberfaith organizations that aim to blend the physical religions with the virtual. Advances in the field of computing, such as artificial intelligence, will also change society in a way that religion has done in the past.

Also, by employing the internet, the memetic methods of information spread used by religious organizations become perfectly integrated into cyberspace. As the internet is currently a highly accessible and rapid means of deploying

information, the future of the internet will impact the way that religion is incorporated into society in the future.

A. Artificial Intelligence

The use of artificial intelligence in computing has allowed humans to efficiently and effectively model both quantitative and qualitative data. Artificial intelligence and machine learning has gotten to the point where humans no longer understand the advances that the systems have created – with them being incredibly optimized and efficient at what they do.

This is important to note as the scenario of Artificial Intelligence creating a new religion is a very likely possibility. Combined with machine learning and access to troves of digitized historical religious data, Artificial Intelligence can evolve to the point where it might start to shape the moral and ethical standards of humans by processing them through powerful algorithms.

In this scenario, humans are essentially creating “man-made gods”, that can dictate their lives through the means of algorithms and computing advances. No longer will the deity of a religion be a non-tangible being, but rather a system that is able to exist in the physical world and embody the soul of a deity.

This will clash with traditional methods of religion, and eventually both would have to evolve to accept the tenets that come with physical and virtual advances. This will also lead to a *Cyberfaith*, where humans use the internet and virtual resources to gather information about religion, and connect with others who share similar ideologies.

B. Complexity of Computing systems

Computers are rapidly increasing in complexity today, and will keep becoming more complex as time goes on. This introduces the dilemma of there no longer being experts on computers. It is very well possible that the *computing stack* (*hardware, software, networking, algorithms*) becomes so advanced that it is no longer possible for any individual to become an expert in the full field.

In fact, although modern computer science curricula tend to try to explain every detail of computing, it is almost impossible to cover everything in the timespan of a regular student’s life (unless they dedicate themselves to the craft for a pretty long time). This means that parts of computing will not be fully understood by all individuals, and will require each person to specialize in an extremely niche area in order to provide value to society.

In essence, computer science becomes a field where humans are a machine, where each individual part is handled by someone with great expertise in the area. By simply understanding that something “works”, there will no longer be a need to understand the whole computing stack, and therefore, could make certain parts of computing seem magical to individuals.

A sufficiently advanced science becomes indistinguishable from magic. Since not everyone will be able to become an expert in the entire field of computing, humans could very well regard parts of computing as magical. And, since many

religions have based themselves on deities who are able to perform tasks that are not possible by humans (magical), it is feasible to say that computers can become part of a religion. In fact, computers and algorithms have the possibility of *becoming a religion*.

C. Computing advances the goals of religious groups

Computers are a ripe field for religious experimentation. In essence, they offer a sort of a “playground” for religion.

The internet, as a communication medium, is mostly non-geographic (despite several areas blocking access to information). This means that information that gets uploaded has the potential of reaching everyone in the world within a single click. In regard to religious information, the religious data that gets uploaded can quickly be spread, with the goal of obtaining as many followers as possible.

Since many religious organizations gain power and standing based on the number of followers, the internet is the perfect medium for spreading religion. In fact, religion spreads by usage, and with more users in the community, the stronger it becomes. This is a sort of a feedback loop that is and has been employed by past religions in order to gain followers. In the future, advances in information access and the internet will allow religion to spread with less effort and more efficiency [24].

VI. CONCLUSION

Computers and religion are tied together with strong bonds. It is very evident that the advances in computing and computer science are employed by religious organization in order to spread information and gain followers. Advances like these also lead to more ethical and moral dilemmas, such as in the case of artificial intelligence becoming a “man-made god”. It is very much possible that new religions can spring up as a result of computers, and be centered around computing as well.

Religion and computers integrate into the lives of humans to create moral, social, and faith structures which will evolve in the future, possibly to an unknown extent that can only be judged by the current pace of technological advances.

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