Preface

Overview of Subject Matter and Topic Content

This text examines the topic "technology and religion." There are various reasons why the intersection of these topics is of interest. This text is certainly not the first to examine the nexus, but we believe it does so from a unique perspective called "synergy." This perspective considers how each field can assist the other in their respective endeavours, how each field is furthered by the impact of the other. The dual consideration of this text is in both (1) the way that religion is being enhanced by technology, and (2) how technology may benefit from a broader basis of input.

In a significant way, this dual consideration of the nexus of technology and religion starts to answer some of the questions raised by the philosophy of technology. The philosophy of technology has raised doubts about whether technology can benefit humanity. Some see technology as "destroying" humanity. There are subtle forms of "destruction" found in the way it "lays waste" human nature through the producer-consumer society it supports; in the very real technological disasters and accidents that harm people; and in the unwitting influences technology brings to everyday life, where it is used without question. One key philosophical issue is that of technological determinism: the idea that society is driven by technology; that humanity is somehow being led by technology rapidly going out of control. Another key question is "how can we relate ourselves to technology in a way that it does not destroy us?" As technology and religion integrate, we find the synergy provides some answer to such key questions raised by the philosophy of technology.

In the analysis of how technology has impacted religion, the text demonstrates an example of how even this facet of humanity has been influenced by technology; some may say that technology has "determined" even this aspect of life. While we do see ways that technology has changed the expression of religion across various cultures, technology is not totally setting the agenda. We see the ways that technology facilitates human-connectedness and interaction; in many instances, virtual religious communities come closer to the heart of community than some expressions of organised religion. We also see interesting technical questions raised in "mediating" social and physical presence through ICT (information and communication) technologies. We are drawn to ask whether the various "Internet congregations" that exist constitute a "church," and ask of the theological validity of "virtual meetings" and "remote religion." While virtual religion may appear to be just another example of technology permeating every facet of life, we see religion as a special part of the human arena being impacted. Religion is a unique field impacted by technology because the field itself is an attempt to transcend the human condition. In this way, as others have noted, there are similarities with technology itself. If technology is accused of relentlessly determining society and the course of human life, in its application to religion, it merely sets humanity on a relentless "spiritual quest": a meta exploration of what it is to be human, answering some questions in the philosophy of technology.

However, the synergy of technology and religion, does more than answer some difficult questions in the philosophy of technology. The synergy contributes to religion itself. It does so in various ways, one of the chief means being the way that "community" is stimulated through virtual life; technology fosters interaction, engagement, participation and an "active" involvement with religion that is quite astounding compared to the worst of institutionalised religion. Moreover, the involvement with religion appears to be answering an interesting dilemma that some found to exist within Christendom, the question of how to be a Christian; how to have "faith" when the dominant institutions of society and culture itself made nominal ascent to doctrine and certain ritualistic traditions the norm and limit of faith. The virtual communities are also suggesting interesting possibilities in the contest of the emerging church and the question of how to be church in the wake of Christendom. While the mediation of physical presence through

technology is currently far removed from face-to-face interaction, there are elements of community that technology enhances. Also, the simple sheer availability and presence of information, contacts, and other resources that ICT mediates is stimulating a spiritual quest among all religions, which is surprising, considering the suggestion of some that technology will quell the "spiritual."

Turning to the other side of "technology and religion," this text also examines how technology may benefit from a broader basis, and actually be impacted by religion. In particular, the way that artificial intelligence (AI) may benefit from theological input. AI also already draws upon many disciplines, from psychology to mathematics, linguistics to computer science. The broad basis of the field is required because AI aims to achieve "intelligent behaviours" in machines; it seeks to reproduce distinctively human abilities, from language to sophisticated reasoning, and in many instances not only reproduces human performance, but seeks to transcend human performance. AI is a unique technology because it intersects so closely with the human world. Intelligent technologies are not just another tool that humanity may use, but intelligent technologies are attempting to reproduce elements of human behaviour. In this way, they are "intruding" into the human world in a unique way. AI is concerned with human behaviour, with the nature and purpose of people and machines. Theology is perfectly able to address such concerns. To some extent, the chief concerns of AI are not "intelligence," but "identity." Indeed, AI might better be considered a pursuit in "artificial identity" rather than "artificial intelligence." Theology informs us of the nature of human identity, suggesting that it includes a moral, relational, and social component, as well as the creative, intellectual, logical and linguistic abilities that AI already recognises.

While AI can be informed by theology, the main synergy of technology and religion contributes to the philosophy of AI. To varying degrees, AI operates under the assumption of computationalism, the idea that thinking is a mechanistic process; that cognition is essentially computation; and that computation can be abstracted as a step-by-step deterministic procedure (most generally expressed in the Turing machine). Such conceptions make philosophical assumptions about the nature of mind, even that "mind" is a separate component of human identity. It also makes assumptions about the possibility of abstracting human identity from a physically incarnated, contextual situ-

ation, and having a step-by-step procedure to explain human "operation." It appears that such assumptions make AI practically possible. We find that they are not only unwarranted, but in many ways inhibit AI from progressing. We seek an alternative conception of computation itself in principle-based engineering (PBE). This conception of computation bears similarities with Putnam's "everything is computation," and also Searle's conception of "observer-related" computation. However, it is uniquely inspired by theological themes.

The main theological theme that informs PBE is "incarnation." Contrary to popular opinion, theology affirms the physical world. In the context of computation, PBE recognises the importance of physically situating and realising computation. Turing was not concerned whether an algorithm was implemented in silicon or bricks: the abstract model was paramount. With PBE, the implementation is paramount; the materials of the implementation are important; being situated in the world, and human context is also essential. PBE also offers AI a nonevolutionary paradigm with a constraint-based alternative. In so doing, it makes possible an alternative general mechanism from artificial life, one that is also distinct from symbolic AI, with its emphasis on formal systems, and sub-symbolic AI, with its particular "neural"-based understanding of mechanisms that are relevant to the operation of the brain. PBE so challenges the "evolutionary" and "emergent" paradigm that has come to dominate AI, reinstating the importance "design" and "purpose" within systems.

Once again, we emphasise that it is the synergy between religion and technology that we find most important and explore in this text. It is a synergy where the pursuits of each field are enhanced by a consideration of the nexus. It is a synergy that addresses particular questions within technology and particular questions within religion: a synergy that contributes to the philosophy of technology, and the questions of how technology can benefit and not destroy humanity. To the extent that technology is determined by humanity, not vice versa, humanity finds benefit.

Where Topic Fits in the World Today

The text emphasises the synergy that is produced in the nexus of technology and religion. It is not a one-sided case of "theology informing technology," nor of "technology informing theology,"

but is a rather unique "marriage" of two disciplines. Perhaps most generally, this text informs the philosophy of technology, having particular implications for the philosophy of artificial intelligence.

Some treatments of "technology and religion" have explored the common themes underlying the disciplines. The theme of "transcending human limitation" has been identified as a common goal of both technology and religion. Technology seeks to overcome humanity's physical and mental limitations. Religion, particularly Christianity, with its concept of resurrection, seeks to overcome human limitation, including the ultimate human limitation of death. This mutual drive to transcend has even been used to explain the emergence of a technological society from a Judeo-Christian culture. However, this text is not primarily interested in the common underlying themes.

Other treatments of "technology and religion" consider the influence of technology upon religion, and do so from a sociological perspective. For example, there is interest in the rise of "virtual religion," mediated through the Internet; how different cultures are appropriating technology for religious expression. Sometimes there is a distinctly Christian interest in religion and technology, where the focus is the analysis of contemporary technological society, and how religious themes may be mediated in that context. While we do consider how technology impacts religion, we recognise that the nexus is more than what technology does for religion.

More rarely, the treatments of "technology and religion" examine how technology is influenced by religion. Most work in this perspective considers the morality of technological application, or perhaps the ethics of scientific experiment. In this sense, religion functions as a guideline for technology, but does not fundamentally change technological practice, other than in some general ways. This text is a little more daring in its examination of theology and intelligent technologies, finding that technology may benefit from a "broader basis."

Description of Each Chapter

Chapter 1, "Technology and Religion," defines both "technology" and "religion." Technology is distinguished from science because it is applied knowledge that impacts daily life. The pervasive nature of technology means that it is technology, rather

than science, that has risen to be a crucial consideration within secular society. Rather than "science vs. religion," it is "technology and religion" that is of interest. Additionally, technology can never be "neutral": there are always moral or ethical considerations, because it is applied. Religion proves hard to define. It may be seen as a social construction, as wish-fulfilment, and as alienation. It is sometimes distinguished from spirituality because of its social nature, although not all religions entail a communal aspect. Having initiated consideration of both technology and religion, we also aim to motivate why the particular combination of religion and technology is of interest. We outline how the topic is of interest to sociology, cultural anthropology, the philosophy of technology, as well as the disciplines of religion and technology themselves. We outline the proposal that the synergy between the topics is the main point of importance, as each enriches the other, and in so doing, also informs the philosophy of technology.

Chapter 2, "The Philosophy of Technology," outlines some of the considerations that philosophers of technology have made, as they reflect upon technology and what it is doing to society and humanity. One of the most poignant questions is that of "technological determinism" and the extent to which technology is "under control." The speed of change, the assumption that technology is beneficial, the uptake and spread of technology through many cultures makes it crucially important to carefully examine the issues. We find the "philosophy of technology" is a relatively young field, and at least two different approaches can be identified: the engineering and humanities approach. Some find that technology is already embedded in society to such an extent that we cannot isolate it and reflect on it apart from anything else: thus the field is already obsolete although the ramifications of technology are by no means over. We consider some of the "issues" of technology that impact society and warrant philosophical consideration. We also distinguish between technology's impact upon society and its impact upon individuals including (1) the "techno-phobia" that is bred by actual technological disasters, and the failures of technology, (2) the "self-sufficiency" that technology fuels, increasing people's autonomy, (3) the "spiritual degradation" created where people are reduced to "machines" in a "producer-consumer" society, and (4) the confusion that technology creates about personal identity.

Chapter 3, "21st Century Technologies," introduces and outlines four different 21st century technologies being (1) ICT — informa-

tion and communication technology, the backbone of society, providing the infrastructure upon which other technologies can sit, (2) AI — artificial intelligence, with its endeavour to make "human-like" machines that are able to undertake intelligent action in the human world, (3) ubiquitous computing and ambient intelligence, promising a seamless environment of information and communication between the human and computer world, and (4) virtual AI, enhancing Internet ICT with intelligence and sophistication, merging with ubiquitous computing to make a world where the interface between the virtual and real are continually blurred. We aim to provide a snapshot of the state of the art in technologies, rather than talk about technology in the abstract. We also introduce the difference between "real AI" and "virtual AI," suggesting that the goals of much current day AI have shifted from those of the pioneer's. The aim to reproduce human behaviour in a machine, and understand how and what computation may achieve this, has been replaced by a new aim: that of supporting human intelligence and producing "smart" gadgets. This means that to some extent, the philosophy of AI has been given a backseat over practical engineering tasks that, in no way, resemble achieving human-like behaviour.

Chapter 4, "Future Directions and the Challenges," describes some of the challenges that face 21ˢᵗ century technologies, focusing upon the challenges of AI. The main challenges revolve around the necessity for machines to relate to the human world, to be contextualised within the world, to be "relational" and "social," with a human-machine interface that surpasses the current scope for interaction. In such a situated context, the "behaviour" of the machine needs to be controlled and carefully considered. It is important to point out some of these challenges, since a later consideration of the philosophy of AI will highlight some of the contributions that can be made to AI with a shift in its underlying philosophy. These challenges represent the current limitations of AI and the problems that require addressing; they motivate some of the future suggestions for "incarnating" computing, and the importance of physically realising a system within the world in order to achieve semantics. Interaction with the world is as vital as interaction with people, and as much a part of human interaction as face-to-face interactions are. Optimistic predications about the future capabilities of technology, and the speed of change, only underlie the fact that

one of the biggest future challenges will be the philosophical and ethical challenge of where we are going with technology. In fact, we find that the future challenges are not just philosophical, but they are theological and religious.

Chapter 5, "The Techno-Religious Age," draws attention to the "religious quest" that is happening in the 21st century world. It points out some of the "similarities" of religion and technology. Both technology and religion are found to have transcendence as a common motivation. The Christian concept of "bodily resurrection" is the prime example of overcoming the ultimate human limitation, death. We also want to introduce and outline five of the major world religions: Christianity, Judaism, Islam, Buddhism, and Hinduism. We seek to observe the ways that they seek to transcend, and how technology has facilitated that transcendence. We particularly seek to draw out where unique elements of the religion intersect with Internet technology, for example, where pilgrimage is important, there are facilities for taking a "virtual tour"; where "image veneration" is important, there is scope for downloading them; where teaching and "knowledge for enlightenment" is vital, there is online learning; where community is important, there are electronic forums stimulating it. In many ways, we are in a techno-religious age, where technology and religion have united in the most human of quests for transcendence.

Chapter 6, "21st Century Christianity," describes Christianity in the 21st century. The background to the contemporary situation is traced through its origins in Christendom, which many see as a failed ideology. We consider some of the ways that Christianity has "failed" in the wars, violence, and persecutions it has caused, the oppression that distorted religion brings (e.g., in colonialism), and the moral failure of its members. Failures of Christianity in history have, by default, been failures of Christendom. The 21st century is witnessing the end of Christendom; there are changes occurring in Christianity. The changes are being noticed among that community which is distinctly the community of those who believe, the church. These changes include many new "expressions" of church outside the institutionalised Christianity of Christendom. One of the biggest innovations being a missional church that is within society. We want to point to the crisis that exists within the church today, and the general decline of participation in the organised church. This context provides the background to understanding the synthesis of technology and religion: a synthesis that is enabling new expressions of religion.

Chapter 7, "Church and the Internet," seeks to understand the different ways that the Internet is being used in entities that might call themselves "church." The examples mentioned range from Internet ventures sponsored by official mainline churches (e.g., I-Church) providing paid staff for pastoral oversight, to those set up by self-help organisations for the blind (e.g., EChurch-UK), to satirical efforts at making religion humorous (e.g., Church of Fools), and sites that appear "scam-like," designed for collecting funds and offering schemes to "get rich." We find that the two main usages of the Internet in Christianity are in (1) fostering "community" through discussion, exchange of opinion, and theological debate at many different levels, and (2) increasingly, the Internet is being used for evangelism. We investigate a typology for "Internet church." Bednell's typology for Internet church predicts six different types of church, based on whether they are founded around "information" or "communication," and then whether they support current institutions, bridge to current institution, or create new forms of institution. Our approach to a typology seeks a classification according to the technological features and ecclesiological functions that a Web site supports. We want to raise the question of whether the Internet church is a "valid expression," and if so, what features are required; if not, why.

Chapter 8, "Christian Community: Real and Virtual," considers the nexus of real and virtual Christian communities. We want to point out some unique characteristics of Christian communities in both the real and virtual worlds. In the real world, we find that, ideally, Christian communities are underpinned by a type of relationship that is unique. Secular communities are broader in type and do not necessarily have this bond underpinning. There is evidence that both secular and religious communities have largely broken down in Western cultures. Many have found that the computer and virtual communities that are emerging are actually assisting people to find community once again. One of the strengths of virtual communities is the "communication" and "interactive life" that underpins them. Interaction is vital in Christian communities, where the community exists for the sake of personal connectedness and building community itself (rather than any purpose such as education or game playing or other). Presence is an issue to consider in virtual communities. It is possible to physically meet and yet fail to "meet" in other ways, raising questions of whether a virtual community is even better than a physical gathering. Nevertheless, technology has a long way to

go before adequately mediating physical presence. As technology progresses, it may be possible to tailor a virtual community to achieve the optimal level of social and physical presence.

Chapter 9, "The Theology of Technology," shifts perspective. Having seen the way that technology is influencing religious expression through virtual religion, we now consider the way that technology may be impacted by theology. We start off distinguishing the term "theology of technology" from "cybertheology," the vague notion that there is "theology" happening in the Internet, because we draw parallels between technological themes and religious themes or find "theological content" present on the Internet. The "theology of technology" is concerned with "conventional theology" being applied to technology. We examine six different patterns for the way that science and theology have been related, and consider how in AI, technology and theology are related in some special ways. One of the most obvious ways that conventional theology can be applied to technology is to provide ethical input into the moral use of technology. Within AI, we are faced with some unique questions of the "morality" of a scientific product itself. The "morality" of human action (and even the possibility of moral behaviour) is a theological question. The question of human morality is intimately related to the question of human identity. For many years, human identity was understood in terms of rational, logical thought. AI will benefit from broadening its conception of human identity, in particular, the insight from theology of "Imago Dei." From Descartes conclusion of "I think therefore I am," to Turing's infamous question "can a machine think?", the Western world has turned to logical thought as evidence of human identity. It is time to broaden the conception.

Chapter 10, "The Philosophy of AI," examines how the "theology of technology" can help inform the philosophical underpinnings of AI beyond the necessity for machine morality. We start with elucidating the idea of computation, from Turing machine computation as "step-by-step" algorithmic procedure, to Putnam's conceptions and "everything is computation," and Searle's "observer-related" computation. Much of AI operates with the assumption of computationalism: the idea that Turing's conception of computation offers an explanation for cognition. We consider some of the arguments for why cognitive functions are nonalgorithmic in Turing's sense. We also consider other "aspects" of human intelligence that are just as important as "thinking": aspects that are not well understood, including "emotional"

intelligence and "relational/social" computing, even "conscious-ness" itself. The objective of this chapter is to outline the under-standing of computation that dominates AI, as well as computer science and much of mathematics. This understanding of com-putation is essentially rule-based, expressed through formal sys-tems such as the Post system, lambda calculus, and the Turing machine. However, for many people, the rule-based mathemati-cal model is the undoing of computationalism, since formal sys-tems have inherent limitations (in expressivity and deductions that can be made), but the human mind does not appear to be lim-ited in the way that formal systems are. This chapter is necessary to provide the philosophical background to the implications that the "theology of technology" has for AI.

Chapter 11, "Principle-Based Engineering," discusses a new con-ception of computation. The conception is one of constraints rather than rules. The constraint-based approach "models" the constraints in operation in the system, and between the system and the environment. There are similarities with Putnam's idea that "everything is computation" because (1) computation must be "situated," and in a profound way, embedded and "incar-nated" in its environment, but, there is also (2) a move away from the intuitive idea of "algorithm" as a step-by-step procedure, since a system is understood in terms of "constraints." We find some theological themes emerge in the importance of "incarnating" computation. There is also a theological theme in moving to-wards a constraint-based understanding of the universe, and away from an "evolutionary" comprehension, where the most general principles of the natural and human world are under-stood in terms of Darwin's evolutionary ideas. Principle-based engineering offers an alternative "general" mechanism over and above the artificial life school and emergent AI. In offering an alternative to the evolutionary paradigm, we can also return to the idea of "design" and "purpose" underlying intelligent systems, and the importance of considering other "general mechanisms" over and above evolution, that may just as well explain the uni-verse and the presence of intelligent beings. We are keen to consider the theological underpinning of such "incarnated" com-puting, over evolutionary approaches.

Chapter 12, "Beyond Culture," concludes the examination of re-ligion and technology. We have explored both how technology is impacting religion and, in the last few chapters, how theology impacts technology. We draw these strands together now in a consideration of the cultural impact that the nexus is having. This

is the scenario of a society where technology and religion not only co-exist, but contribute mutual benefit to each other in their synergy. We start by describing the new global or "transcultural" culture that some people consider ICT technology is creating: a techno-culture that transcends particular traditional cultures. We propose the Five-Is of information, immediacy, interaction, intelligence and Internet as underpinning elements of computer-facilitated life in such a culture. We see such a transculture as a framework for a techno-religious age, a global "virtual worldview" that frames society and life in a technologically impacted, and impacting age. We also examine the consequences of not acknowledging the nexus of technology and religion, reiterating the importance of this nexus of technology and religion. Technology, like religion, represents humanity's striving to transcend. Yet religion and technology may both be regarded as "human constructions" within which it is probably impossible to transcend the human paradigm. In their respective ways, both technology and religion work together to reveal what it is to be human — in revealing the machine and in revealing the human. Both religion and technology can point humanity to the divine, the source and end of "faith."

Conclusion

Religion and Technology in the 21st Century: Faith in the E-World is a unique treatment of technology and religion. It will interest a variety of readers especially readers from:

- **Artificial intelligence:** The "synergy" that we have already outlined makes the text contribute uniquely to AI. Practically, it suggests a paradigm and philosophy of doing AI that is very important for the technical world;

- **Christian theology:** The "synergy" that we have outlined makes the text contribute uniquely to religion, particularly Christianity. Practically, it suggests a way of "doing religion" that is also important for the religious world. It raises the question of whether religion can facilitate faith, and the shape of a post-Christendom church that facilitates faith and not religion;

- **Cultural anthropology and philosophy of religion:** The text gives a rare examination of the "transcendence" offered

by five major world religions, and how technology facilitates that, assisting appreciation of how technology and religion integrate in a variety of societies. Practically, it helps comprehension of the extent of penetration of technologies into different religions, and how cultures are influenced by the synergy of technology and religion.

- **Philosophy of technology:** Those concerned about technology and its influences on humanity will be reminded of the pressing questions of the age, and encouraged to think afresh about the unique status of religion as a field impacted by technology, and the ways that technology may indeed help humanity, and not "lay waste" its nature. Practically, it offers justification for the continuation of technology, even if there were a choice to suppress it, tainting the justification of that continuation with the importance of "connecting" humanity with its "spiritual quest" and intrinsic identity and nature.

Religion and Technology in the 21st Century: Faith in the E-World will assist readers of various levels, especially those pursuing research in: (1) the impact of technology upon society, (2) the philosophy of AI, and (3) contemporary Christianity. It is a text that challenges established disciplinary boundaries, making it relevant to a wide audience.