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Technology and Sacrifice

Massimo Leone

Department of Philosophy and Educational Sciences, University of Turin, 10124 Torino, Italy; massimo.leone@unito.it

Abstract: This paper investigates the complex relationship between technology, religion, and sacrifice, positing this last term as a pivotal concept for understanding the evolution and impact of technological advancements. Through a detailed examination of various cultural and religious frameworks, it explores how artificial intelligence and other modern technologies both challenge and redefine traditional notions of the sacred and the profane. By analyzing historical and contemporary practices, the study highlights the paradoxical role of sacrifice in the digital age, serving as both a metaphor for the loss inherent in technological progress and a foundational principle that shapes the ethical landscapes of innovation.

Keywords: technology and sacrifice; religious practices in the digital age; artificial intelligence ethics; technological progress and spirituality; cultural impact of innovation

> Darkness spills across the sky like an oil plume.
> The moon reflects bleached coral. Tonight, let us
> praise the sacrificed.
> (Santos Perez 2016)

1. Introduction

This study explores the complex interplay between technology, religion, and the notion of sacrifice,[1] charting a nuanced course through their intersections in the modern world. Initially, it examines the impact of technological progress on human understandings of sacrifice and the divine, proposing that artificial intelligence (AI) both enriches and challenges established religious norms. The analysis spans a range of perspectives, highlighting AI's dual capacity to disrupt and enhance spiritual practices. By scrutinizing various narratives and case studies, the paper aims to reveal the intricate ways technology intersects with, and sometimes contradicts, age-old religious rites. Further, it questions AI's influence on ethical decision-making within religious contexts, exploring how technology might reshape traditional understandings of sacrifice. Concluding with a forward-looking discussion, the study identifies potential future intersections of AI, religion, and sacrifice, underscoring the need for ongoing dialogue around the ethical, theological, and societal ramifications of this convergence.

2. Language and Sacrifice

With every major technological advancement, humans are prompted to redefine themselves.[2] Indeed, it is plausible that the primary motive behind technological progression is for humanity to thoroughly reimagine its existence (Coeckelbergh 2023). In doing so, it taps into the boundless potential that evolution has endowed upon the human condition, striving to extend the limits of what can be achieved (Cutter 2023). Humans seem increasingly unwilling to tolerate the presence of unfulfilled possibilities within themselves (Forlano and Glabau 2024). The mere concept of fantasy,[3] highly valued by philosophers, is no longer sufficient (Hamilton and Lau 2024). Nor is the realm of imagination, or even a collective imaginary (Crabu et al. 2024). People seek tangible representations, something

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that transitions from potentiality to sensory perception through the concrete expression of ideas, thus becoming perceptible and tangible for all to see and experience (Bechberger et al. 2021). While fantasies, imagination, and the imaginary hold varying levels of social significance, they are, to some extent, always enigmatic and concealed, lying partly in realms beyond visibility and perception (Ernst and Schröter 2021). However, with significant effort and at great expense, humans push towards a utopian vision of absolute perceptibility (Hanemaayer 2022). This endeavor may stem from a desire, or perhaps an anxiety that escalates into dread, to manifest aspirations in a way that makes them universally appealing and simultaneously satisfies yet intensifies desire (Blevins and Zalloua 2023). Humanity no longer just imagines but actively creates, positioning itself as a divine entity, not just nurturing creation internally but making space for it in the external world for all to witness (Cohen 2024).

The irony for the technological creator, however, is that creation is not an exclusive privilege but a shared responsibility among numerous creators, each connected to a democratic deity of sorts (Viola 2023). Thus, the quest for visual representation evolves, aiming not just for recognition but for the creation of indistinguishable simulacra of potential; the dream of converting absolute potential into reality seems to materialize with each technological breakthrough, addressing a deep-seated anthropological insecurity (Henshaw 2023). Technology promises the transformation of internal potential into external reality and the infinite into the actual (Vernallis et al. 2021). Yet, this anthropological perspective is far from neutral, rooted in a biological foundation influenced by an image economy with deep historical, political, and cultural ties, including the history of religions (Hornborg 2023). The increasing human desire to externalize, perceive, and experience potential in all its forms is driven by a fundamental desire to claim ownership, to delineate boundaries of possession, and to exclude others from that ownership (Mejias and Couldry 2024). The marketplace serves as the overarching structure for this image economy, which is part of a long-term biocultural shift that frames desire not as mere contemplation but as appropriation (Borghi and Brownsword 2023). Even religions, despite some opposing appropriation, contribute to this dynamic. Contemplation often transforms into a consumable, commodifiable, and appropriable externality, not just an inward journey devoid of consumption (Deutschmann 2019). Temples are not merely spaces for internal reflection but technological constructs that make the divine imagination communal, thereby igniting perpetual disputes over possession and control (Rose 2019). Politics emerges as a clever solution to prevent the excesses of contemplation from descending into violence, aiming to regulate desires and distribute potentialities (Liere and Meinema 2022). Yet, the same technology enabling an exponential increase in desire also contributes to psychological overload (Mosurinjohn 2022). Humans become overwhelmed by their external creations and by the tangibility of their desires (Righi 2021).

Emerging prominently in this context is a powerful concept from religious thought: true contemplation, which is neither about dominating sacred spaces nor about democratic management but involves subtraction, withdrawal, and sacrifice (Odell 2023). Unlike consumerist minimalism (Newport 2019), sacrifice involves relinquishing not a void but abundance, destroying not potential but actuality, thereby also extinguishing desire for the existing (Stapleton 2022). Through sacrifice, communities periodically relearn the importance of unity, not through desire but through renunciation (Christin 2021). It is by forgoing the externalization and actualization of potential that humans can coexist peacefully with others, with nature, with fellow humans, and ultimately with themselves (Nunziato 2020). Postmodern interpretations that depict sacrifice as a celebratory gathering overlook its essence (Holleis 2017). Sacrifice involves embracing our finiteness and understanding mortality while appreciating life. It delicately navigates the tension between our biological drive for desire and imagination and the real world that must accommodate these desires amid a plurality of beings (Nail and Ellsworth 2020). However, such moments of true contemplation and communal spirituality are rare and often incidental. Literature, arts, and architecture consume not just physical resources but also language, increasing the domain

of the expressible and encroaching upon the realms of the unexpressed and the unseen (Wang 2020). Technological memories and generative AI further diminish the space for the unarticulated, challenging the notion that the arts liberate humans from the constraints of tangibility (Stafford 2019). Perhaps no space for spiritual affirmation exists without simultaneously consuming the world's resources (McGowan 2017). Even the seemingly ethereal communal activities of large sea mammals require physical space and the sounds they produce, which are disrupted by human technological noise (Au and Lammers 2016).

Sacrifice presents an opportunity for humans to recognize that unexpressed potentiality constitutes true wealth (Scott 2023). True enjoyment of the infinite lies not in outward expression or communal contemplation but in internal reflection that consumes nothing and dwells within the soul's recesses without necessitating transformation into projects or tangible outcomes (MacKendrick 2001).[4] This exploration into the infinity of one's imagination opens up the realization that others too possess an infinite inner world; Lévinas' philosophy encapsulates this insight in the concept of the ethical face, which transcends mere visual perception or shared suffering (Ebert 2020). The intangibility of the other stems from their inner infinity, inspiring respect and ethical consideration (Lesch 2022). The relentless drive towards expression, fueled by the market's demands, consumes time and resources, eroding the opportunity for true contemplation (Alford 2020). In expressing oneself, one uses up not only physical and linguistic resources but also time, leaving little room to recognize the infinite worlds behind others' faces (Peck et al. 2019). The contemporary obsession with expression overlooks the faces of worlds, forgetting that true happiness might lie in facing the Other and imagining their boundless inner world (Das and Choudhury 2015).

3. AI and Sacrifice

The intersection of religions, artificial intelligence (AI),[5] and the concept of sacrifice forms a compelling and complex narrative that demands exploration. Digital advancements, particularly AI, are reshaping religious practices, beliefs, and the fundamental understanding of sacrifice in modern contexts. The dialogue on AI's role in religion often vacillates between utopian and dystopian perspectives, underscoring a need to navigate the "Prophetic Gray Zone", where the implications of AI for faith are neither wholly positive nor entirely negative (Campbell and Vitullo 2024). This gray zone challenges simplistic binary judgments of technology's impact on religion, advocating for a nuanced appreciation of AI's potential to both enhance and disrupt traditional religious expressions. By examining AI through the lens of digital religion studies, one encounters a dynamic field where technology intersects with faith in multifaceted ways, offering new platforms for worship, community building, and the pursuit of spiritual understanding. Yet, this intersection also raises ethical considerations and questions about the nature of religious experience in the digital age.

The evolution of religious practices in response to digital technologies invites one to reconsider the notion of sacrifice[6] within these new contexts because digital advancements, especially AI, are reshaping how religious experiences and ethical decisions are mediated. This transformation challenges traditional understandings of sacrifice by introducing new forms of moral and ethical dilemmas, altering the boundaries between the sacred and the secular, and requiring a reassessment of what constitutes a sacrificial act in an increasingly digital and interconnected world. The integration of AI into religious frameworks prompts reflections on how digital environments redefine the essence and expression of sacrificial acts, emphasizing the need for a balanced approach that honors both technological progress and spiritual values. AI's capability to mediate religious experiences, from virtual reality church services to algorithmically curated spiritual content, prompts reflections on how digital environments reshape the essence and expression of sacrificial acts. As AI becomes increasingly embedded in religious frameworks, it challenges one to rethink the boundaries between the sacred and the secular, the material and the virtual, and the human and the artificial. This exploration into religions, artificial intelligence, and sacrifice reveals the complexity of integrating cutting-edge technologies with ancient traditions. It

underscores the importance of critical engagement with technology in religious spheres, advocating for a balanced approach that recognizes both the opportunities and challenges posed by AI. Through this lens, one is invited to navigate the gray areas of digital religion, embracing innovation while remaining mindful of the profound implications for faith and practice in a rapidly evolving digital landscape.

4. Perspectives on Techno-Sacrifice

Shibuya (2022) delves deeply into the nuanced interplay between religions, artificial intelligence (AI), and the notion of sacrifice, with a significant focus on the ethical implications of integrating AI into religious practices and societal norms. It examines how AI challenges and reshapes traditional religious concepts, particularly sacrifice, by introducing new forms of moral and ethical dilemmas. The text also discusses the potential of AI to serve as a tool for enhancing spiritual experiences and ethical decision-making while raising critical questions about autonomy, agency, and the authenticity of AI-mediated religious practices. Through a multidisciplinary lens, the article explores the transformative potential of AI in redefining the boundaries between the sacred and the profane, urging a reevaluation of how technology influences our deepest moral values and spiritual beliefs in the contemporary world. The examination of sacrifice, particularly in terms of distribution and the inevitable disparities between sacrifices made and the outcomes thereof, provides a compelling framework to consider the intersections with AI, religions, and the concept of sacrifice. In religious contexts, sacrifice often symbolizes devotion, offering, and the seeking of favor or forgiveness from a higher power. This traditional view embodies both physical and metaphysical dimensions, where the act of sacrificing is intrinsically linked to the spiritual and moral values of a community or individual.

When one introduces AI into this dialogue, the concept of sacrifice takes on new dimensions. AI, as a creation of human intellect and labor, represents a different kind of offering—not to a deity, but to the altar of progress and utility. The sacrifices made for the development and integration of AI into society include not just economic and labor costs but also ethical considerations,[7] privacy concessions, and the potential loss of certain human skills and jobs. These are the "sacrifices" of the modern era, paralleling those historical sacrifices made for communal or divine favor. The reflection on "distribution of sacrifice" mentioned in the article (Shibuya 2022) is particularly pertinent. Just as sacrifices in religious contexts were not borne equally across all members of society, the benefits and burdens of AI are unevenly distributed. Some individuals and communities bear the brunt of job displacement, privacy invasions, and ethical quandaries, while others reap the benefits of convenience, enhanced services, and new opportunities. This disparity invites a critical examination of how one can ensure a more equitable "distribution of sacrifice" in the age of AI.[8]

Furthermore, AI's role in potentially transforming religious practices and experiences—from AI-driven analyses of sacred texts to virtual religious ceremonies—challenges one to reconsider what constitutes a "sacrifice" in a digital age. Can offering data, attention, or even computational resources be seen as modern forms of sacrifice? And if so, to what end are these sacrifices made, and who or what mediates these offerings? Ultimately, the integration of AI into human lives and spiritual practices invites a reevaluation of the concept of sacrifice, urging one to question who benefits, who suffers, and how one can navigate these ethical landscapes with compassion and justice. The notion that real sacrifices involve navigating the differences between effort and outcome, as highlighted in Shibuya's article, becomes a poignant metaphor for our collective journey into the future with AI at the human side.

According to Magnani (2023), the complex dynamics between moral and violent behavior and the crucial role of abduction are pivotal yet underexplored in philosophical and cognitive studies. In this context, "abduction" refers to the process of forming explanatory hypotheses, a type of reasoning that is crucial for understanding and predicting behaviors. Magnani introduces an eco-cognitive perspective, leveraging concepts like

salience, abduction, and affordance to shed new light on these relationships. He presents a unified morphodynamical framework for examining physical, biological, and cognitive processes together, elucidating the role of abduction. The discussion extends to the use of salience in explaining behaviors like bullying within a "military intelligence" context and the impact of fallacies on language-based violence. This comprehensive approach also explores coalition enforcement, integrating morality and violence from a paleoanthropological standpoint, thus offering insights into the interplay between cognition, morality, and violence. Relating this to AI, religions, and sacrifice, one could argue that AI, in mirroring complex human cognitive processes, might also navigate the nuanced territory of moral and violent behaviors. In religious contexts, where sacrifice often symbolizes a moral high ground or a necessary evil for a greater good, AI's potential to make autonomous moral decisions—or to simulate such decisions based on abduction—raises intriguing questions. How might AI handle the complexities of moral judgment, especially when it involves sacrificing for the greater good, akin to historical or religious sacrifices? This reflection points towards a future where AI's role in moral and ethical decisions is not only inevitable but also deeply intertwined with our understanding of morality, sacrifice, and the cognitive underpinnings of such decisions.

A different, more technical notion of "sacrifice" emerges from Companez and Aleti (2016), which focuses on the Monte-Carlo Tree Search (MCTS) algorithm's ability to identify and execute sacrifice moves in games. In this context, sacrifice moves are defined as strategically losing a resource to gain a long-term advantage. The study uses Ultimate Tic-Tac-Toe (UTTT) as a testbed to investigate MCTS's performance in scenarios involving sacrifice moves, exploring various enhancements to MCTS, such as Decisive Moves, Weighted Updates, and Rapid Action Value Estimation (RAVE), to improve its ability to recognize and benefit from these moves. This research aims to understand how MCTS and its enhancements can effectively manage sacrificial strategies and their implications for AI game-playing and decision-making strategies.

While the term "sacrifice" is used differently in this technical context compared to religious notions, there is a deeper connection beyond mere equivocation. Both concepts involve a deliberate relinquishment of something valuable for a perceived greater benefit. In MCTS, the sacrifice of resources is a calculated decision to improve long-term outcomes, paralleling how religious sacrifices often involve giving up something significant to achieve a higher spiritual or communal goal. This comparison underscores a shared underlying principle: the intentional trade-off of immediate loss for future gain, whether in the strategic realm of AI algorithms or the moral and ethical frameworks of religious practices. By examining these parallels, we can gain a richer understanding of how the concept of sacrifice operates across different domains and its implications for decision-making processes in both AI and human contexts.

An area where these apparently very theoretical reflections have found tangible application is autonomous vehicles (AVs). Bruno et al. (2023) investigates how the framing of self-sacrifice influences moral judgments and emotions in scenarios involving autonomous vehicles (AV).[9] It differentiates between human-driving and AV contexts, analyzing responses to dilemmas where self-sacrifice is required for the greater good. The research reveals variations in moral judgments and emotional responses, highlighting how different levels of driving automation shape our moral evaluations and feelings about self-sacrifice. This analysis has implications for understanding moral perceptions in the age of autonomous technology. Articles of this sort explore the interplay between AI, ethical notions of sacrifice, and decision-making, shedding light on how technological advancements challenge and reshape human moral frameworks. The reflections on AI in moral dilemmas, especially in autonomous driving scenarios, reveal a complex landscape where traditional concepts of self-sacrifice are reevaluated in the context of machine decision-making. This reevaluation mirrors religious discussions of sacrifice, where the act is often seen as a noble, altruistic offering for the greater good. AI introduces a new dimension to these discussions, as algorithms now make decisions that can involve sacrifices without

human intervention, prompting one to reconsider the ethical implications of such actions. The convergence of AI and religious ethics in discussions of sacrifice underscores the need for a nuanced understanding of morality in the age of technology, highlighting the importance of incorporating diverse ethical perspectives in the development and deployment of AI systems.

Gantsho (2022) discusses the ethical considerations of autonomous vehicles (AVs) in scenarios requiring a tragic choice, where a decision must be made to sacrifice one individual to save many. The author advocates for a randomized, impartial selection process for such decisions, emphasizing that the selection should not consider personal characteristics, including whether the individual is a passenger or owner of the AV. This approach seeks to navigate the complex ethical landscape of machine agency and the moral responsibilities of AVs in life-and-death situations. The reflection on autonomous vehicles (AVs) and their ethical decision-making in life-and-death scenarios resonates deeply with themes found in religious discourse on sacrifice. In many religious traditions, sacrifice is seen as an act of giving up something valuable for the sake of something or someone else considered more important. The proposed random selection method for AVs, which is impartial and ignores personal characteristics, mirrors certain religious notions of universality and equality before the divine. This approach raises profound questions about the role of AI in making ethical decisions traditionally grounded in human morality and spirituality. It challenges us to reconsider the values humans want embedded in autonomous systems and how these values reflect or diverge from those upheld by various religious traditions.

Bodenschatz et al. (2021) also explores the ethical implications of programming autonomous systems (AS) to make randomized decisions in dilemmatic situations where harm is unavoidable. It presents empirical evidence suggesting that many people prefer the outcomes of ethical dilemmas to be determined by chance due to moral considerations. This preference persists across different cultures and contexts, challenging both utilitarian and deontological ethical frameworks. The study's findings highlight the complexity of integrating AS into societal frameworks, emphasizing the need for alignment with human moral intuition and the potential of randomization as a non-discriminatory alternative in AS decision-making.

Mamak (2021) discusses the complex issues surrounding the moral and legal status of robots, particularly in life-and-death scenarios. It explores whether robots should be granted rights and how they should be valued relative to humans in ethical dilemmas. The author proposes recommendations for robot design to prioritize human life and ensure that robots can be easily distinguished from humans in critical situations. This reflection prompts a broader discussion on the evolving relationship between humans and technology, mirroring religious narratives on sacrifice and the value of life,[10] where the essence of moral and ethical debates shifts from traditional human-centered dilemmas to include AI and robots, challenging us to redefine the boundaries of moral consideration and legal rights in a technologically advanced society.

Along the same trend of reflection, Komatsu et al. (2021) explores cultural differences in moral judgments of robots by comparing U.S. and Japanese responses to robots in moral dilemmas. It finds that both cultures blame robots more than humans when failing to intervene in such dilemmas. The study suggests that, despite cultural differences in viewing robots' moral agency and applying norms, the pattern of assigning blame to robots over humans for inaction is consistent across cultures. This indicates a universal aspect of moral judgment involving robots, highlighting important considerations for the design and implementation of autonomous systems in morally significant roles. The study on moral judgments towards robots across the U.S. and Japan can be linked to discussions on AI, religions, and sacrifice by examining the ethical considerations and cultural perceptions that inform how societies engage with technology in moral contexts. In religious traditions, sacrifice often involves ethical dilemmas where moral judgments and actions reflect deeper values and beliefs. Similarly, assigning blame to robots over humans in moral dilemmas highlights a universal concern for ethical responsibility and the sacrificial role

of AI in taking on burdens that might traditionally fall to humans. This convergence suggests a broader dialogue on how technology embodies, challenges, and redefines concepts of sacrifice and moral decision-making across different cultural and religious backgrounds, underscoring the importance of integrating ethical considerations in the development and implementation of AI systems.

A specific trend in literature has explored the contribution of Christianity to reflection on technology and sacrifice. According to Sjöstrand (2021), Derrida's examination of the relationship between religion and technology, specifically within the context of modernity, challenges traditional dichotomies such as religion vs. science and faith vs. reason. He argues for a foundational "elementary faith" that underpins both religion and technology, suggesting an autoimmune relationship where religion simultaneously utilizes and rejects technology. Derrida is particularly interested in how religion, especially Christianity, intertwines with the media to disseminate its message globally. This unique feature of Christianity—its universal claim propelled by media—positions it distinctively as a religion deeply embedded with and dependent on media technologies.

Along the same line, Delio (2020) discusses Pierre Teilhard de Chardin's perspective on evolution, suffering, and the concept of transhumanism, contrasting it with secular transhumanism's aim to transcend human limitations through technology. Teilhard saw evolution as a process towards unitive love, highlighted by the Christian narrative of resurrection and transformation. His vision emphasizes the integral role of suffering and sacrifice in the evolutionary process, aligning with a more spiritual and interconnected understanding of human progress and diverging from technological transhumanism's focus on individual enhancement. Pierre Teilhard de Chardin's work integrates a deeply spiritual perspective into the conversation about evolution and the future of humanity. He contrasts sharply with secular transhumanist ideologies by embedding the process of evolution within a Christian theological framework, emphasizing the transformative power of suffering and the pursuit of unitive love. Teilhard's vision offers a unique lens through which to examine the implications of technological advancement, suggesting a path that harmonizes scientific progress with spiritual evolution.

5. The Christian Perspective

A comprehensive exploration of the theological and spiritual significance of sacrifice in Christianity would require perusal of its multiple historical and biblical contexts, analyzing how sacrifice is conceptualized and practiced from the Old Testament's diverse sacrificial acts to the New Testament's reinterpretation of sacrifice through Jesus Christ's life, death, and resurrection. It would also involve an examination of the evolution of sacrificial understanding in early Christian thought, emphasizing the spiritualization of the concept and its implications for Christian living. Linking this historical and theological exploration of sacrifice to the development of artificial intelligence (AI) and its intersection with religion offers a fascinating reflection. As AI continues to advance, it raises ethical and moral questions reminiscent of the discussions around sacrifice. Just as religious sacrifice involves giving up something valuable for a greater good, the integration of AI into society requires sacrifices in terms of privacy, employment, and even ethical decision-making. The concept of sacrificial love in Christianity, emphasizing self-giving for the well-being of others, mirrors the potential of AI to serve humanity's greater good, albeit within ethical and moral frameworks that respect human dignity and freedom. This parallel invites a deeper consideration of how technological advancements can be harmonized with spiritual values, ensuring that the sacrifices made in the name of progress truly benefit humanity as a whole.

6. An Intersection to Be Explored

The theme "AI and Religion" intersects with the discussion on sacrifice in several intriguing ways. As AI continues to evolve and integrate into various aspects of human life, including spirituality and religious practices, it raises profound questions and possibilities.

First of all, AI can assist in the deep analysis and interpretation of religious texts, including those discussing the concept of sacrifice. Advanced algorithms and natural language processing tools can uncover new insights, patterns, and connections within and across texts that might remain obscure to human researchers. This could lead to richer understandings of sacrifice in religious contexts, enhancing theological studies and personal spirituality. Second, in the area of modeling and simulating religious practices, AI can be used to create simulations and models of religious rituals and practices, including those involving sacrifice. This could serve educational purposes, helping believers and non-believers alike to understand the significance and impact of these practices throughout history and in contemporary settings. For instance, virtual reality (VR) simulations powered by AI could immerse individuals in historical or symbolic representations of sacrificial rites, offering new perspectives on their spiritual significance.

Ethical and theological reflections on AI are also paramount. The development of AI itself can be framed within the theme of sacrifice. As humanity invests resources, time, and ethical considerations into the creation and deployment of AI, it reflects a kind of sacrificial commitment to progress and the pursuit of knowledge. However, this also raises ethical questions about what is being sacrificed in the process, such as perhaps certain human capacities and skills. These developments can prompt theological reflection on the nature of sacrifice, value, and the human relationship with creation and the creator. But AI can also be a facilitator of religious experience. AI technologies could facilitate new forms of religious experience and community (Singler 2017). For example, AI-driven platforms could customize spiritual guidance and practices for individuals, integrating teachings on sacrifice and other religious concepts into daily life in a personalized manner. This could support personal growth, ethical living, and a deeper engagement with one's faith tradition. That might lead, in turn, to exploring the limits of AI in understanding sacrifice. While AI can offer new insights and support religious practices, it also encounters limitations. The deeply personal, transcendent, and mystical aspects of sacrifice in religious life challenge AI's capacity for comprehension and empathy. This limitation invites ongoing dialogue about the unique aspects of human spirituality that technology cannot replicate or replace, emphasizing the importance of human agency, intentionality, and emotional depth in religious practices.

The notion of sacrifice and ethical considerations is not unique to the development of AI technologies but applies to the creation and deployment of any new technology. The process of innovation and progress often involves trade-offs, resource allocation, and potential consequences that need to be carefully weighed and addressed. However, there are a few reasons why it is particularly relevant and important to highlight the theme of sacrifice in the context of AI development. First, AI technologies have the potential to fundamentally transform various aspects of human life, society, and our relationship with technology in unprecedented ways. The capabilities of AI systems, such as machine learning, natural language processing, and decision-making, are rapidly advancing and could have far-reaching implications that we are only beginning to understand. Given the profound impact that AI could have on humanity, the sacrifices and trade-offs involved in its development carry greater weight and significance compared to many other technologies. The ethical considerations and potential consequences demand heightened scrutiny and reflection. Second, the development of AI also raises fundamental questions about the nature of intelligence, consciousness, and what it means to be human. As AI systems become more advanced and capable, they challenge our understanding of cognition, decision-making, and the boundaries between humans and machines. These existential and philosophical questions inherently invoke themes of sacrifice, value, and the human relationship with creation and the creator. The sacrifices made in the pursuit of AI development are not merely practical but also involve sacrificing certain assumptions, beliefs, and paradigms about the human condition. Third, AI technologies have the potential to disrupt various industries, labor markets, and social structures. The deployment of AI could lead to the displacement of certain human skills and jobs, raising concerns about the sacrifices made

in terms of employment, economic stability, and the role of human labor. Additionally, the ethical implications of AI decision-making, bias, privacy, and accountability are significant and require careful consideration of the trade-offs and sacrifices involved in ensuring the responsible development and deployment of these technologies. Therefore, while the theme of sacrifice is indeed relevant to the development of any technology, the unprecedented capabilities, existential questions, and far-reaching societal implications of AI make it particularly important to highlight and reflect on the sacrifices and ethical considerations involved in its creation and deployment.

7. Enlarging the Domain of Sacrifice in Religious Studies

Sacrifice, often involving the offering of animals or even humans, has been practiced in many societies, including ancient Hebrews, Greeks, pre-Columbian Mesoamerican civilizations, and European cultures. Sacrifice serves various purposes, such as propitiation, worship, appeasement of gods, or altering the course of nature, and it often has social or economic functions within cultures. Sacrifice is deeply rooted in religious practices and has been seen as a means to bond communities, particularly through male rites involving blood and fertility-related rituals. The concept of sacrifice extends to self-sacrifice and metaphorical uses, such as doing good for others or enduring a loss for greater gain. Animal sacrifice, in particular, has been a common practice in many religions, serving not only religious purposes but also social and economic ones, as the meat is often shared among participants. Human sacrifice, though now universally condemned, was practiced by ancient cultures to please gods, accompany the dedication of significant structures, or in times of natural disasters. Specific religions, including Christianity, Hinduism, Islam, and Judaism, have their own interpretations and practices related to sacrifice. Christianity, for example, centers on the sacrifice of Jesus Christ for the reconciliation of God and humanity, and the Eucharist is seen as a re-presentation of this sacrifice. Islam practices animal sacrifice during Eid ul-Adha to share good fortune with the needy, reflecting Abraham's willingness to sacrifice his son at God's command. In Judaism, after the destruction of the Second Temple, ritual sacrifice ceased, except among the Samaritans. While the forms and understandings of sacrifice vary widely across different religions and cultures, it remains a powerful symbol of devotion, obedience, and community cohesion.

As argued by Kitts (2022), the notion of sacrifice is not limited to the act of ritual killing but encompasses a wide range of practices aimed at establishing a connection with the divine, atoning for sins, rectifying social disequilibrium, and inducing existential epiphanies about life and death. The book emphasizes the analytical challenges posed by the broad and often vague categorization of sacrifice, urging a re-examination of what constitutes sacrificial acts beyond the dramatic ritual killing of animals or humans. By exploring embryonic theories of sacrifice in biblical, Christian, Vedic, and classical Greek contexts, Kitts highlights how ancient texts problematize the practice of sacrifice, revealing underlying tensions and ambivalence. Kitts also scrutinizes specific literary accounts of premodern human ritual killings, including Aztec, Chinese, and Greek traditions, to demonstrate the complex cosmological and ritual dynamics at play. The analysis reveals that sacrificial practices are deeply embedded in the religious, cultural, and social fabric of societies, serving multiple purposes and meanings beyond the mere act of offering. The book underscores the importance of contextualizing sacrificial practices within their respective religious and cultural milieus to fully understand their significance and function.

Relating the detailed exploration of sacrifice in Margo Kitts' Sacrifice (Kitts 2022) to the theme of "Religions and AI", several key intersections and implications emerge. First and foremost, the comprehensive study of sacrificial practices across cultures and religions can be augmented by AI technologies, which could analyze vast collections of religious texts, rituals, and historical accounts to offer new insights into the evolution of sacrificial practices. This could deepen our understanding of the diverse motivations and significance attached to sacrifice in different religious traditions.[11]

8. Conclusions

From a certain perspective, artificial intelligence, especially its advanced and generative forms, represents a significant, perhaps unprecedented, step in humanity's long history of pursuing fulfillment through the realization of imagination's full potential, encompassing all desires and fantasies. This perspective views AI platforms as seemingly limitless sources for expressing and actualizing human potential. Yet, perhaps through engaging with this non-human imagination and recognizing the substantial material resources it demands, humans may become more aware of their own misconceptions. AI, a creation mirroring humanity yet distinct, might serve as a catalyst for recognizing human limitations. The repetitive and often excessive outputs of AI could lead humanity to a critical realization: true value lies in imagining the unexpressed, the silent potential of the other. In relinquishing the relentless pursuit of self-expression, humanity may find a richer, shared silence—a hopeful retreat into the infinite potential of the unspoken community.

Craig Santos Perez, a poet, essayist, and university professor from the Chamorro people, born in Mongmong-Toto-Maite, Guam Island, wrote in his 2016 poem "Halloween in the Anthropocene":

> Darkness spills across the sky like an oil plume.
> The moon reflects bleached coral. Tonight, let us
> praise the sacrificed. Praise the souls of black
>
> boys, enslaved by supply chains, who carry
> bags of cacao under West African heat. "Trick
> or treat, smell my feet, give me something good
>
> to eat," sings a girl dressed as a Disney princess.
> Let us praise the souls of brown girls who sew
> our clothes as fire unthreads sweatshops into
>
> smoke and ash. "Trick or treat, smell my feet, give me
> something good," whisper kids disguised as ninjas.
> Tonight, let us praise the souls of Asian children
>
> who manufacture toys and tech until gravity sharpens
> their bodies enough to cut through suicide nets.
> "Trick or treat, smell my feet, give me," shout boys
>
> camouflaged as soldiers. Let us praise the souls
> of veterans who salute with their guns because
> only triggers will pull God into their ruined
>
> temples. "Trick or treat, smell my feet," chant kids
> masquerading as cowboys and Indians. Tonight,
> let us praise the souls of native youth, whose eyes
>
> are open-pit uranium mines, veins are poisoned
> rivers, hearts are tar sands tailings ponds. "Trick
> or treat," says a boy dressed as the sun. Let us
>
> praise El Niño, his growing pains, praise his mother,
> Ocean, who is dying in a warming bath among dead
> fish and refugee children. Let us praise our mothers
>
> of asthma, mothers of cancer clusters, mothers of
> miscarriage—pray for us—because our costumes
> won't hide the true cost of our greed. Praise our

> mothers of lost habitats, mothers of fallout, mothers
> of extinction—pray for us—because even tomorrow
> will be haunted—leave them, leave us, leave—

like 1In the human relentless pursuit of technological advancement, the poem starkly reminds us of the tangible and intangible sacrifices made in the name of progress. Among these sacrifices, perhaps the most pivotal yet overlooked is the dream of infinite self-expansion. This realization invites one to ponder whether the true advancement of our civilization lies not in endlessly extending our reach but in mindfully embracing the limits of growth and existence. In doing so, humans may uncover a path forward where sacrifice transforms into a conscious choice for balance and sustainability, reflecting a deeper understanding of the human place within the broader tapestry of being.

The poem by Craig Santos Perez poignantly highlights the human toll and environmental devastation caused by relentless industrialization, consumerism, and exploitation of resources. It serves as a powerful critique of the pursuit of progress at the expense of human dignity, ecological balance, and sustainability. While the poem does not explicitly mention artificial intelligence (AI), the sacrifices and consequences depicted could be attributed to various human activities and industries, not just AI. However, the relevance of AI in this context lies in its potential to amplify and accelerate the very patterns of exploitation and disregard for life that the poem laments. AI is a powerful and rapidly advancing technology that, if not developed and deployed responsibly, could exacerbate the issues raised in the poem. First, the poem references the exploitation of child labor in supply chains and sweatshops: AI systems could be used to optimize and intensify such exploitative practices, prioritizing efficiency over human rights and well-being. Second, the development and deployment of AI systems require significant computational resources and energy consumption, potentially contributing to environmental degradation and climate change if not managed sustainably. Third, AI-driven automation could lead to widespread job displacement, particularly in industries reliant on manual labor, potentially exacerbating economic inequalities and exploitation. Fourth, AI systems can perpetuate and amplify existing societal biases and prejudices, further marginalizing vulnerable communities and perpetuating cycles of oppression.

Nevertheless, AI also holds the potential to address and mitigate the very issues raised in the poem if developed and deployed with ethical considerations and a commitment to sustainability. AI can be used for environmental monitoring, predictive modeling, and optimizing resource utilization, contributing to conservation efforts and sustainable practices; AI-driven automation could alleviate the need for hazardous or exploitative human labor, provided that the economic benefits are distributed equitably; concerted efforts can be made to develop AI systems that are transparent, accountable, and free from harmful biases, promoting fairness and inclusivity; AI technologies can be leveraged to amplify the voices of marginalized communities, promote education, and facilitate access to resources and opportunities.

The relevance of AI in the context of the poem, therefore, lies not in its inherent nature but in its transformative potential—both positive and negative. As a powerful and rapidly evolving technology, AI has the capacity to either perpetuate or alleviate the patterns of exploitation, environmental degradation, and human suffering depicted in the poem. It is crucial to approach the development and deployment of AI with a deep sense of ethical responsibility, prioritizing human dignity, environmental sustainability, and the well-being of all life. While the poem's critique extends beyond AI to encompass broader human activities and industries, the transformative power of AI makes it a particularly relevant consideration in the pursuit of a more just, sustainable, and equitable future. By recognizing the potential consequences of AI, both positive and negative, we can strive to harness its capabilities in service of human flourishing while mitigating its potential for harm and exploitation.

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Notes

[1] In this article, sacrifice is conceived as the complex and multifaceted act of willingly relinquishing something of intrinsic value—be it material possessions, personal desires, or potential opportunities—to uphold ethical integrity, spiritual beliefs, and communal harmony. This concept of sacrifice is particularly relevant in the context of modern technological advancements, such as artificial intelligence, where it involves navigating the tension between the drive for innovation and the need to preserve human dignity, ethical principles, and the sacredness of traditional religious practices amidst rapidly evolving digital landscapes.

[2] The literature on the relationship between technological advancement and the redefinition of religious cultures is vast. Among the most recent contributions, see Breyer et al. (2024), which investigates the relationships between gestures and artifacts theoretically and historically; Kane (2024), which offers an emergent model of the human mind rooted in our experiences as living, sentient, social, and conscious beings; more specifically, Maasen et al. (2020) introduces the term "TechnoScienceSociety" to highlight the continuous technological reconfigurations of science and society; MacFarlane (2020) explores Technological Human Enhancement Advocacy through ethnographically inspired participant observation at various sites; Reijers and Coeckelbergh (2020) proposes that technologies, much like texts, novels, and movies, 'tell stories' and thus shape our lifeworld in the Digital Age; Isetti et al. (2021) explores the use of digital media in religious engagement and how new media can influence and transform faith and spirituality; Mercer and Trothen (2021) introduces the religious and ethical implications of biohacking, artificial intelligence, and other technological advancements; Taylor et al. (2021) investigates the contemporary influence of the visual at the crossroads of humanity and technology. Baggot et al. (2022) examines what constitutes a suitable enhancement for humanity in the era of nanotechnologies, biotechnologies, information technologies, and cognitive science technologies. Chen (2022) delves into how tech companies are integrating religion into the workplace, effectively replacing traditional places of worship. Dator (2022) advocates for transcending culturally, historically, ethnically, and biologically grounded identities as the basis for an authentic self. Jorion (2022) explores the path initiated by the Enlightenment's concept of human perfectibility; Laughlin (2022) examines the unexpected intersection between American evangelicalism and tech innovation. Savin-Baden and Reader (2022) explores the interplay between technologies and the content of religious belief and practice. Terrone and Tripodi (2022) addresses the issue by linking the ontology of technology with its ethical and aesthetic significance. Dyer (2023) explores the evolution of Bible software and app development, highlighting the significant influence of evangelical entrepreneurs and coders. Michalowska (2023) addresses the challenges and strategies involved in defining what it means to be human. Telakivi (2023) contends that conscious experience can extend beyond the brain and body, manifesting through specific types of environmental interactions and tool use. Zimmermann (2023) examines the question of human identity and flourishing in the context of recent technological advancements.

[3] The notion of "fantasy" should be philosophically important because, while philosophers typically favor thought experiments—exploring hypothetical scenarios to examine their implications—fantasies can serve a similar function. Fantasies allow us to envision possibilities beyond the constraints of reality, expanding our conceptual horizons and stimulating creative thinking. By considering fantastical scenarios, philosophers can explore the boundaries of concepts, challenge existing paradigms, and generate innovative solutions to complex problems. Thus, the concept of fantasy, like thought experiments, should be highly valued in philosophical discourse for its potential to deepen our understanding and foster intellectual growth.

[4] While some may question the validity of this assertion, it is important to recognize that this vision is indeed present in many spiritual and religious cultures. Traditions such as Buddhism, certain branches of Hinduism, and the mystic aspects of Christianity and Islam emphasize the importance of inner reflection and meditation as pathways to spiritual fulfillment. In our current age, it is urgent to rekindle this ancient wisdom. The modern aesthetic economy, with its emphasis on outward expression and tangibility, often leads to the overconsumption of resources and can strain interpersonal relationships. By revisiting and valuing the internal, reflective practices championed by these traditions, we can foster a more sustainable and balanced approach to living. This shift could help mitigate the environmental impact of our consumption-driven society and promote deeper, more

meaningful connections among individuals. Thus, the emphasis on internal reflection is not only historically and culturally significant but also timely and relevant in addressing contemporary challenges.

5 Literature on religion(s) and AI is burgeoning; among the most recent contributions, besides the publications already mentioned in note 2, see Beck et al. (2021), which examines the profound impact of the digital transformation on church and theology, exploring the cultural, theological-anthropological, ecclesial, and media ethical dimensions of the digital revolution; Lane (2021), which examines why humans identify with religious groups despite physical and temporal separation, proposing an "Information Identity System" model that integrates religious studies with psychology, anthropology, and AI to explore conceptual ties between self-concept and ancient beliefs, using examples like global Pentecostalism, religious extremism, and the impact of 9/11 on sermons to contextualize contemporary religious and cultural changes; Wilson (2021), which argues that, with the rapid advancement of digital, biotechnologies, and AI-driven robots, a collective effort involving Christian theology is essential to regulate AI and protect humanity and all life, similar to the global efforts that have prevented the destructive use of nuclear bombs; Singler (2022), which explores the intersection of artificial intelligence and atheism and analyzes how AI narratives, such as those in Dan Brown's "Origin," reflect and influence modern atheist perspectives and the perceived end of religion, while also examining public discourse on AI's role in advancing human rationality and its potential to replace religious belief with a scientific worldview. Wilks (2023), which traces the history and workings of artificial intelligence through the lens of magic, explores its controversies and achievements, and considers its future impact on humanity, assessing whether AI technologies will ultimately benefit or threaten our way of life; Paulus (2023), which argues that the Christian apocalyptic imagination can transform our perspectives on and use of artificial intelligence, guiding us to envision a future where AI participates in the new creation; Puzio et al. (2023), which explores changes in the human image through robots, religious robots, body optimization, medical technologies, autoregulatory weapon systems, and transformations in theology, presenting new interdisciplinary research findings from around the world; Herzfeld (2023), which explores the theological implications of AI by examining whether authentic relationships between humans and AI are possible and how AI's presence changes human interactions, utilizing Karl Barth's relational understanding of the *imago Dei* to investigate these questions and concluding with an analysis of the incarnation to emphasize the importance of embodiment for full relationality (see also Abraham et al. (2021)); Smith (2023), which introduces the term "robotic animism" to describe how people interact with robots as if they have minds or personalities, compares it to the concept of "mind-reading" in human-robot interactions, presents examples, evaluates ethical considerations, and explores whether current robots could be said to possess minds in a meaningful sense; a bibliography of previous literature on religion(s) and AI can be found at URL https://religionswissenschaft.zegk.uni-heidelberg.de/mitarbeitende/pages/prohl/AI/Literatur.html (accessed on 3 May 2024).

6 In this article, sacrifice is conceived as the act of relinquishing something valuable or significant, both tangible and intangible, to achieve a greater good or to maintain ethical and spiritual integrity amidst the advancements and impacts of technology, particularly artificial intelligence, on societal and religious practices.

7 The sacrifices made for the development and integration of AI into society include ethical considerations in the sense that these advancements necessitate difficult moral decisions and the potential relinquishment of certain ethical standards or norms. Ethical considerations are sacrifices because they often require balancing the benefits of technological progress against the potential harms or risks to individuals and society. This can involve compromising on privacy, autonomy, and equitable treatment, as well as confronting issues related to job displacement, data security, and the moral implications of delegating decision-making to machines. In navigating these ethical dilemmas, society may have to forgo certain ideals or accept trade-offs that challenge established moral frameworks, thus constituting a form of sacrifice.

8 The notion of sacrifice should be adopted to explain these effects and economic externalities because it encapsulates the trade-offs and ethical dilemmas inherent in the integration of AI into society. Sacrifice highlights the unequal distribution of costs and benefits, where some individuals and communities face significant hardships such as job displacement, privacy invasions, and ethical challenges, while others enjoy the advantages of technological advancements. By framing these disparities in terms of sacrifice, it becomes clear that the benefits of AI are not uniformly experienced and that certain groups are disproportionately burdened. This perspective encourages a more critical and ethical examination of how to mitigate these imbalances and ensure a fairer distribution of both the sacrifices and rewards associated with AI, emphasizing the need for policies and practices that address the social and economic inequities that arise from technological progress. Talking in terms of "sacrifice" rather than "inequality" emphasizes the intentional and ethical dimensions of the trade-offs involved in AI integration, highlighting the conscious choices and moral implications of unevenly distributed burdens and benefits.

9 The explicit or implicit literature background of these articles is that of the famous "trolley problem"; among the most recent contributions in the field, see Edmonds (2013), Kamm and Rakowski (2016), Jenkins et al. (2022), Lillehammer (2023), Wainwright (2024); about the application of AI to the trolley problem, see Krügel and Uhl (2022), Peng et al. (2022), Woollard (2023), Amigud (2024), Sleigh et al. (2024), Chandak et al. (2024), Stenseke (2024), Symons and Abumusab (2024).

10 The ethical dilemma of choosing between saving a human or a robot in a life-or-death scenario echoes certain religious and moral narratives that grapple with the value placed on different forms of life. Many religious and philosophical traditions have stories, parables, or thought experiments that explore the moral quandaries surrounding sacrifice and the relative value assigned to different lives. For example, the biblical story of Abraham being commanded to sacrifice his son Isaac tests the limits of obedience to divine will over the preservation of human life; the Hindu epic Mahabharata contains the narrative of

Karna having to choose between saving his spiritual guru or his friend in battle, forcing him to weigh competing loyalties; the already mentioned trolley problem thought experiment in ethics asks whether it is permissible to sacrifice one person to save a greater number, probing our moral intuitions about the value of individual lives. By framing the robot-human dilemma in this context, we suggest that just as religious narratives have long grappled with questions of sacrifice and the moral value of life, the increasing capabilities of AI and robots now force us to reevaluate and expand the scope of these age-old ethical deliberations to include artificial entities; see also Bertolini and Episcopo (2022) and DeGrazia (2022).

[11] Research in this area might benefit from further exploration of a crucial aspect of sacrifice, particularly as understood within the religious traditions central to the civilization from which AI emerges. Sacrifice in these contexts is viewed as an expression of an interpersonal relationship—whether to God or to fellow humans. It is always a unique, unrepeatable decision and gift. This leads to an important question: Can AI replicate this kind of relationship, characterized by love for God or humans, as a personal and novel decision and gift? Or does a person, in delegating part of their human capabilities to AI, diminish their own humanity? Another question arises: By embedding ethical and moral decision-making principles into AI, thus vastly expanding its capabilities, does humanity itself risk becoming more machine-like and dehumanized? This phenomenon is paralleled in the realm of communication, where the incredible potential of new media paradoxically results in a decline in genuine interest and ability to communicate. Similarly, the virtual world's expansion of reality often leads to disinterest, boredom, and frustration. Despite the remarkable new opportunities AI provides for studying the concept of sacrifice, the act of sacrifice itself, in both religious and interpersonal contexts, likely remains uniquely human. Personal sacrifice, therefore, may serve as a safeguard against the dehumanizing potential of AI. It is not a rejection of AI's possibilities but rather an indication of a crucial, essential collaboration between natural and artificial sacrifice.

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