Artificial Intelligence and Liturgy: Eight Exploratory Trajectories

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Introduction

This paper explores eight trajectories for liturgical theologians and ministers to examine the profound implications of artificial intelligence (AI) for liturgical praxis and theological inquiry. While AI is not a new phenomenon, recent advancements—most notably the launch of ChatGPT 3.5 in November 2022—have brought its capabilities into sharper focus, reshaping the socio-cultural landscape and prompting urgent new questions for theology and worship.[1] The structure begins with AI's immediate practical implications for liturgical ministry and progresses toward broader anthropological, ecological, and theological considerations, inviting reflection from both practitioners and theorists.

Although prior scholarship has investigated the intersections of religion, media, and technology, the specific impact of recent AI developments on liturgical worship remains underexamined—especially as AI becomes increasingly integrated into daily life. While I write as a theologian rooted in the Roman Catholic tradition, the reflections here consider a broader spectrum of Christian worship practices and also gesture toward inter-religious contexts in which AI's role in shaping worship might be explored.

To ground this discussion, it is essential to establish a shared understanding of artificial intelligence and its relevance to liturgical studies. Broadly defined, AI is "technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy."[2] A subset of AI, known as generative AI, has gained particular attention for its ability

1. Only two months after its launch, ChatGPT 3.5 reached 100 million monthly active users, making it the fastest-growing consumer application in history. See Andrew R. Chow, "How ChatGPT Managed to Grow Faster Than TikTok or Instagram," *Time* (Feb. 8, 2023): https://time.com/6253615/chatgpt-fastest-growing.
2. Eda Kavlakoglu and Cole Stryker, "What is Artificial Intelligence (AI)?" (IBM: Aug. 9, 2024): https://www.ibm.com/think/topics/artificial-intelligence.

to produce text, images, music, and other creative outputs by analyzing patterns in existing data.

However, these opportunities are accompanied by challenges, as will become clearer as this paper progresses. Concerns about accuracy, hallucinations (false information generated by AI), copyright infringement, and the ethical implications of job displacement in creative roles demand careful and thoughtful consideration. Religious institutions, including the Vatican, The Southern Baptist Convention, and the United Methodist Church have issued statements on ethical AI, emphasizing the need for AI to align with principles of transparency, inclusion, and accountability to ensure that technological advancements respect human dignity and serve the common good.[3] These principles are especially pertinent in liturgical contexts, where the integrity of sacred texts and their faithful transmission directly shape worship and community life.

Far from being merely a technological tool, AI represents a phenomenon that intersects profoundly with theological reflections on technology, ethics, and worship. By approaching AI as both a challenge and an opportunity for liturgical praxis, this paper seeks to open new pathways for reflection.

ONE: Generative AI, Text and Trans-Formation

Generative AI, a subset of artificial intelligence, refers to systems capable of seemingly "creating" new content by learning from vast datasets. However, some argue that these so-called "creations" since they are really amalgamations of existing data, recombined in innovative ways.[4] Nevertheless, tools such as ChatGPT, Claude, and Gemini exemplify this capability, generating human-like text for diverse applications. Historically, AI has evolved from simple computational models to sophisticated generative systems that mimic creative processes, raising important questions about their role in fields as varied as technology, education, and medicine.

The advent of generative AI tools has sparked significant interest in their potential to transform not only creative industries but also liturgical ministry, where

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3. Religious institutions who have issued statements and reflections on the ethical implications of artificial intelligence (AI), include: the Southern Baptist Convention released *Artificial Intelligence: An Evangelical Statement of Principle*s in 2019, addressing the ethical challenges and opportunities presented by AI (https://erlc.com/policy-content/artificial-intelligence-an-evangelical-statement-of-principles/); and the Vatican's recent *Antiqua et Nova: Note on the Relationship Between Artificial Intelligence and Human Intelligence* (Jan. 2025): https://www.vatican.va/roman_curia/congregations/cfaith/documents/rc_ddf_doc_20250128_antiqua-et-nova_en.html. For a summary of *Antiqua et Nova,* see my introduction, "Bringing the Church's Wisdom to a Changing World," in *Antiqua et Nova* (Mahwah, NJ: Paulist Press, 2025), vi-xv.
4. See Anil R. Doshi and Oliver P. Hauser, "Generative AI enhances individual creativity but reduces the collective diversity of novel content," *Science Advances* 10:28 (July 12, 2024): https://www.science.org/doi/pdf/10.1126/sciadv.adn5290?utm_source=chatgpt.com.

text, scriptural proclamation, and preaching play vital roles.[5] These tools present intriguing possibilities for praxis. They can assist in drafting prayers (e.g., the Prayers of the Faithful), homilies, rituals, and rites, enhancing efficiency while offering surprisingly creative suggestions. AI also serves as a powerful analytical tool, facilitating deeper engagement through tasks such as analyzing existing texts, performing scriptural exegesis, suggesting improvements, and tailoring content for specific liturgical communities. For example, AI tools can translate texts into over 100 languages, enabling broader accessibility for diverse worship practices and contexts.

For those engaged with liturgical formation, generative AI introduces significant questions. For instance, the ability to generate entire homilies within seconds prompts reflection on how this speed might affect the deeper spiritual and formational process traditionally involved in homiletic preparation. Preachers have long placed high value on sitting with the scriptural readings over an extended period, allowing the text to permeate their hearts and minds. This reflective practice not only enriches the homily but also deepens the preacher's spiritual maturity and strengthens their credibility as a witness to the homily's theme. As Robert Morneau suggests:

> Before proclaiming and interpreting God's Word, preachers must never fail to spend sufficient time meditating on the Scriptures. *Lectio divina* is a proven discipline in preparing for the preaching ministry. This method employs the mind in discursive pondering, the heart in affective response, and offers an invitation to quiet the mind and heart so that the prayer of loving attention (contemplation) might be experienced. Preaching devoid of prayer might still impress the congregation with a show of intelligence and eloquence, but it will be lacking a Spirit-filled discourse.[6]

While these tools provide unprecedented access to new opportunities and resources, they also challenge all liturgical ministers to discern the boundaries between automation and authentic formation. The key may lie in viewing AI as a tool to support—rather than replace—these formational and spiritually enriching processes. For instance, the speed and efficiency of generating liturgical texts need not diminish the importance of time spent in prayerful reflection, especially if ministers approach AI-generated outputs as preliminary drafts rather than finished products. Ultimately, integrating generative AI into liturgical contexts requires both openness to innovation and vigilance to preserve the depth of spiritual formation. Striking this balance will ensure that AI enriches, rather than undermines, the art of liturgy.

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5. Heidi A. Campbell and Pauline Hope Cheong, eds., *Thinking Tools on AI, Religion, and Culture* (Network for New Media, Religion & Digital Culture Studies, 2023): https://eprints.soas.ac.uk/39897/1/Thinking%20Tools%20for%20AI%20Religion%20&%20Culture-FINAL.pdf
6. Robert F. Morneau, "Preaching as a Spiritual Exercise," in *A Handbook for Catholic Preaching*, ed. Edward Foley, Catherine Vincie, and Richard Fragomeni (Collegeville, MN: Liturgical Press, 2016), 3-4.

TWO: Collaborative Creativity: AI-Generated Art in Worship Spaces

Generative AI has made significant strides in the world of art, pushing boundaries and redefining what it means to create. A striking example is Refik Anadol's *Unsupervised* installation at the Museum of Modern Art (MoMA) in New York City.[7] Anadol's team created a spatial map of the museum's collection using advanced machine learning tools. By training a generative adversarial network (GAN) to navigate this map, the AI processes patterns and ideas, perpetually generating new visual forms that are displayed as high-resolution, ever-evolving animations. The result transforms the museum's lobby into a dynamic art space, where visitors encounter mesmerizing visuals that feel alive, constantly shifting in unpredictable ways.[8] Anadol's work challenges traditional notions of creativity by blending human artistry with machine innovation, turning raw data into something deeply emotional and awe-inspiring.

A worship community could conceivably create an installation inspired by Anadol's *Unsupervised*, using generative AI to process the collective artwork and historical artifacts of their community, local church, or diocese. The result might be a morphing piece of art that evolves over time, reflecting the living history and spirituality of the community. Placed within a worship context, such artwork could evoke contemplation and wonder, serving as a visual representation of the dynamic relationship between tradition and innovation. How might such an approach enhance worship spaces while remaining theologically grounded and culturally resonant?

The tools behind such innovations, like DALL-E and MidJourney, are becoming increasingly accessible, raising intriguing possibilities for the integration of generative AI into liturgical art. These tools allow communities to visualize and embody theological themes in new ways, democratizing access to creative processes. However, these developments also come with ethical concerns, particularly regarding copyright infringement[9] and the question of originality in AI-generated art, including whether AI-created and human-made art are evaluated by the same standards.[10] Addressing these issues requires thoughtful dialogue about intellec-

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7. Refik Anadol's *Unsupervised:* https://www.moma.org/calendar/exhibitions/5535.
8. A YouTube video captures this experience: https://www.youtube.com/watch?v=5Y384U-bOJo.
9. See the U.S. Congress, House of Representatives, Committee on Science, Space, and Technology. *Hearing on Oversight of Artificial Intelligence Tools and Implications for Federal Policies.* 118th Cong., 1st sess., May 16, 2023. https://www.congress.gov/118/chrg/CHRG-118hhrg53722/CHRG-118hhrg53722.pdf. See also Blake Brittain, "Tech Companies Face Tough AI Copyright Questions in 2025," Reuters, December 27, 2024. https://www.reuters.com/legal/litigation/tech-companies-face-tough-ai-copyright-questions-2025-2024-12-27/?utm_source=chatgpt.com.
10. C. Blaine Horton, Jr., Michael W. White, and Sheena S. Iyengar, "Bias Against AI Art Can Enhance Perceptions of Human Creativity," *Scientific Reports* 13:19001 (2023): https://www.nature.com/articles/s41598-023-45202-3#citeas.

tual property and the theological significance of creative expression in worship contexts.

This also raises the question of the role of the liturgical artist: Could the accessibility of AI tools potentially diminish the need for skilled liturgical artists, as non-artists might use these technologies to produce art for worship spaces? While these tools enable individuals with little or no artistic training to create visually compelling pieces, the depth of theological reflection, cultural sensitivity, and spiritual insight traditionally brought by experienced liturgical artists remains vital. Rather than framing this as a conflict, it might be more productive to view AI as a collaborator, augmenting the creative process while still requiring the expertise of liturgical artists.[11]

Ultimately, theological and liturgical scholarship could explore the themes that emerge from integrating generative AI tools and new installations into worship spaces. What theological narratives might arise from the interplay of evolving AI-generated art and architecture? How might these artworks shape communal prayer, reflection, and the understanding of creativity? By embracing AI as both a challenge and an opportunity, worship communities can reflect deeply on how these tools can serve—not replace—the human and spiritual dimensions of liturgical art.

THREE: AI Tools and the Future of Liturgical Music: Opportunities and Cautions

AI's impact on music mirrors its influence on art but diverges in its performative nature, particularly within worship contexts. Generative tools in music must navigate the theological and expressive interplay of sound, text, and participation that is essential to liturgy. These tools are proving invaluable for music directors, singers, and instrumentalists by streamlining the planning, preparation, and rehearsal processes for worship music.[12] Their capabilities include analyzing a community's extensive repertoire and offering curated suggestions for music that align with the liturgical calendar, scriptural readings, and pastoral needs; automating scheduling and rehearsal planning to maximize efficiency for choirs and musicians; and translating original lyrics into the diverse languages spoken within a parish, fostering inclusivity and deeper engagement in worship.

In the realm of worship music composition, AI tools like Suno, Stable Audio, and Worship.ai have the potential to revolutionize this ministry. They allow compos-

11. The debate over whether robots might replace humans in the field of sculpture is explored in: "Robots Sculpt Marble in Italy, Sparking Worries about Future of Art Form," *60 Minutes*, November 12, 2024: https://www.youtube.com/watch?v=_VlkMuo2Zcs.
12. Antonella Di Giulio, "Artificial Intelligence in Ecclesiastical Music Planning: A Personal Exploration," *Musicaiq,* September 6, 2023, https://musicaiq.com/2023/09/06/artificial-intelligence-in-ecclesiastical-music-planning-a-personal-exploration

ers—or non-composers—to quickly generate new works and tailor arrangements to the needs of specific ensembles. Operating by analyzing input—such as thematic, textual, or stylistic descriptions or instructions—these tools utilize advanced machine learning models to produce songs that align with the given criteria.

As a demonstration, I used Suno to generate a song using a relatively short prompt: "Write a communion song for a Roman Catholic Mass for the Solemnity of the Epiphany of the Lord, using references to the gospel Matthew 2:1-12." In less than a minute, the text, music, and recording were generated:

Title: Star-Lit Journey[13]

Verse
Strangers from a distant land,
Following a star so grand.
Gifts they brought to lay before
Child of light forevermore.

Chorus:
Gold for a king,
Incense in air,
Birth for life so rare.
Shepherds, kings, and angels sing,
Praise to the newborn King.

Verse Two:
Wise men travelled far and wide
To the humble place He'd hide.
Bethlehem a town so small—
There they found the King of all.

What is even more remarkable is that two musical versions and recordings were generated for the same set of lyrics, both performed by the same simulated male vocalist and AI-generated band in a country style.

The specifics of Suno's training data have not been publicly disclosed, but it is likely built on a vast corpus of existing music, enabling the tool to learn patterns, structures, and styles across various genres. Not surprising, the use of copyrighted material in such datasets has drawn legal scrutiny. In June 2024, major record labels

13. Ricky Manalo, CSP, musical recordings generated using Suno.com (Dec. 20, 2024), unpublished digital recordings. For a video demonstration of *Star-Lit Journey*, see: "*Star-Lit Journey*," YouTube video, 3:08, July 17, 2025, https://youtu.be/UybtwMzc26I. This video features one of the two musical versions created by Suno. For Suno's copyright policy regarding AI-generated songs, see: https://help.suno.com/en/articles/2746945.

filed lawsuits against AI companies, including Suno, alleging unauthorized use of copyrighted recordings in their training.[14] Despite these controversies, worship communities continue to explore and utilize these tools, demonstrating their potential.[15]

FOUR: AI, Culture and the Paradox of Accessibility

AI offers significant opportunities to enhance liturgies in multicultural contexts by bridging socio-cultural gaps. Its tools can support the planning and preparation of liturgical elements, such as translations, contextualized prayers, and culturally tailored resources. Additionally, AI-powered platforms can foster better intercultural communication and collaboration by breaking down language barriers and creating spaces for shared understanding. Training programs that utilize AI can prepare liturgical leaders and ministers to navigate cultural differences more effectively, ensuring that worship practices remain both authentic and meaningful across diverse communities.

By democratizing access to these tools, AI tools could empower socio-cultural groups, particularly those in underserved communities, enabling them to actively participate in global worship contexts. Further, this democratization amplifies their ability to share their unique cultural expressions, fostering inclusivity and enriching the global liturgical life. But while the democratization of AI could lead to more accessibility, significant challenges remain. Access to AI tools is often uneven, placing underserved communities at risk of exclusion.[16] Biased algorithms, shaped by specific socio-economic contexts, can inadvertently prioritize homogenized liturgical expressions, sidelining unique cultural practices and traditions. Furthermore, AI's efficiency-driven approach could compromise the authenticity and depth of liturgical heritages, reducing rich traditions to functional outputs that fail to capture their spiritual and cultural significance. Without intentional

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14. https://www.reuters.com/technology/artificial-intelligence/music-labels-sue-ai-companies-suno-udio-us-copyright-infringement-2024-06-24/?utm_source=chatgpt.com.
15. Using Perplexity.ai with the following: "Are there any composers currently using AI-generated songs for worship? If so, please provide the names of their churches or houses of worship, along with references to relevant articles." Nineteen articles and weblinks appeared, including guidelines such as "Composing Hymns and Worship Music with AI," *AI Church Assistant*, February 16, 2024, https://www.aichurchassistant.com/composing-hymns-and-worship-music-with-ai/, and reports on worship communities exploring this option, such as "Texas Church Experiments with AI-Generated Service, Uses ChatGPT for Worship, Sermon, and Original Song," *Fox News*, September 18, 2023, https://www.foxnews.com/us/texas-church-experiments-ai-generated-service-uses-chatgpt-worship-sermon-original-song.
16. Virginia Eubanks, *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor* (New York: St. Martin's Press, 2018); Cathy O'Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* (New York: Crown, 2016), cited in *Encountering Artificial Intelligence: Ethical and Anthropological Investigations*, eds. Matthew J. Gaudet, Noreen Herzfeld, Paul Scherz, and Jordan J. Wales (Eugene, OR: Pickwick Publications, 2024), https://dspt.edu/client_media/files/91230-encountering-artificial-intelligence-ethical-and-anthropological-investigations.pdf.

efforts to address these disparities, AI risks exacerbating existing socio-economic inequalities rather than alleviating them.

While AI presents significant opportunities to enhance liturgies in multicultural contexts and global worship participation, the lack of access to AI tools is not necessarily detrimental. In some cases, non-accessibility to AI may encourage local worship communities to cultivate their own liturgical fluency, relying on the creativity, resources, and cultural wisdom present within their congregation. By working without the influence of generative AI tools, communities may deepen their connection to their oral traditions and develop liturgies that are more organically rooted in their unique cultural and spiritual identities. In this way, the absence of AI may serve as an invitation to rediscover the depth and richness of human creativity in worship, ensuring that the liturgy remains an organic reflection of the community it serves.

FIVE: AI and Ecological Liturgy: Responding to Environmental Challenges Through Worship

Having examined how AI is already reshaping key dimensions of liturgical practice—such as text generation, visual art, and music—we now begin a second arc of inquiry. The remaining trajectories move beyond immediate ministerial concerns to explore how AI intersects with broader cultural, ecological, and theological questions that shape the future of worship. This next section considers the environmental costs of AI and their implications for liturgical responses grounded in ecological ethics.

A pressing and increasingly critical concern is the ecological impact of AI technologies. Recent civic and religious contributions to ethical AI emphasize the need to address its environmental footprint. As Karen Hao reminds us, "Digital technologies do not just exist digitally. The 'cloud' does not in fact take the ethereal form its name invokes."[17] The United Nations' *Governing AI for Humanity* (2024) underscores the ecological dimensions of global AI governance.[18] Similarly, the Roman Catholic Church has articulated an ethical response to these challenges through its teachings on stewardship and the promotion of the common good. Pope Francis, in his address *The Common Good in the Digital Age* (2019),[19] highlighted the inextricable link between technological progress and ethical responsibility, a concern deeply embedded in his encyclical letter, *Laudato Si'* (2015).[20]

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17. Karen Hao, *Empire of AI: Dreams and Nightmares in Sam Altman's OpenAI* (New York: Penguin Press, 2025), 274.
18. https://www.un.org/sites/un2.un.org/files/governing_ai_for_humanity_final_report_en.pdf.
19. Pope Francis, *The Common Good in the Digital Age* (September 27, 2019): https://www.vatican.va/content/francesco/en/speeches/2019/september/documents/papa-francesco_20190927_eradigitale.html.
20. Pope Francis, *Laudato Si'* (May 24, 2015): https://www.vatican.va/content/dam/francesco/pdf/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si_en.pdf.

On October 24–25, 2024, the Builders AI Forum at the Pontifical Gregorian University in Rome gathered key stakeholders to explore how AI might align with the Church's mission while addressing its broader ethical and environmental implications.[21] Building on these discussions, the Vatican released *Antiqua et Nova* on January 14, 2025 which further refines the Church's engagement with AI, offering a framework that integrates ethical, technological, and ecological perspectives. Taken together, these efforts signal a growing recognition of AI's profound impact on creation and the urgent need for responsible action.

AI technologies come with significant ecological costs, including energy consumption, water use, and carbon emissions, all of which contribute to environmental imbalance. Below are some of the primary ecological concerns tied to AI systems:

- *High Energy Consumption:* Training large-scale AI models, such as GPT or other neural networks, requires massive computational resources, leading to energy demands that rival those of entire countries.[22]
- *Water Usage for Cooling:* Data centers supporting AI operations consume vast amounts of water to cool their servers, exacerbating water scarcity in many regions.[23]
- *Carbon Footprint*: The electricity powering AI systems often relies on non-renewable energy sources, contributing significantly to greenhouse gas emissions.[24]
- *Resource Extraction:* AI development depends on rare earth elements and other materials whose extraction processes harm ecosystems and communities.[25]
- *E-Waste Generation:* The rapid obsolescence of hardware designed for AI contributes to the growing problem of electronic waste, further stressing the planet's resources.[26]

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21. The Builders AI Forum (October 24-25, 2024): https://www.baif.ai. The author of this paper invited to participate as a member of a panel entitled "What's the Prophetic Vision for AI in the Church?"
22. Bill Tomlinson, Rebecca W. Black, Donald J. Patterson, and Andrew W. Torrance, "The carbon emissions of writing and illustrating are lower for AI than for humans," *Scientific Reports* 14:3732 (2024): https://www.nature.com/articles/s41598-024-54271-x.
23. Auji Jeevan Birkesh, Rakhi Gupta, and Nashrah Gowalker, "Impact of Generative AI on Water Resources Used to Cool Data Centers," *International Journal of Progressive Research in Engineering Management and Science* 4:11 (November 2024): 842–845, https://www.ijprems.com/uploadedfiles/paper/issue_11_november_2024/36551/final/fin_ijprems1731517868.pdf.
24. Qiang Wang, Yuanfan Li, and Rongrong Li, "Ecological Footprints, Carbon Emissions, and Energy Transitions: The Impact of Artificial Intelligence (AI)," *Humanities and Social Sciences Communications* 11:1043 (2024), https://www.nature.com/articles/s41599-024-03520-5.
25. "Critical Minerals: Roles for Artificial Intelligence in Supporting of FECM RDD&D Priorities" (Washington, D.C.: U.S. Department of Energy, Fossil Energy and Carbon Management, March 2023), https://www.energy.gov/sites/default/files/2023-03/ai-role-in-critical-minerals.pdf.
26. Isabelle Dumé, "Generative AI Has an Electronic Waste Problem, Researchers Warn," *Physics World*, December 13, 2014, https://physicsworld.com/a/generative-ai-has-an-electronic-waste-problem-researchers-warn/.

These examples highlight the environmental toll of AI, underscoring the urgency of developing sustainable practices that mitigate its ecological impact.

Fortunately, a rich tradition in liturgical scholarship has long addressed the intersection of liturgy and ecology, exploring how worship can serve as a meaningful response to these challenges.[27] Mary E. McGann explores the relationship between the Eucharist and these concerns by envisioning the sacrament as a profoundly ecological act that reflects creation's interdependence and integrity. In her 2020 work, *The Meal that Reconnects: Eucharistic Eating and the Global Food Crisis,* McGann critiques the anthropocentric focus of traditional worship and aligns with ecological theology by emphasizing that Eucharistic bread and wine—gifts of the Earth and human labor—symbolize the interconnectedness of all life.[28] She proposes liturgical practices such as outdoor Eucharistic celebrations, laments for environmental destruction, and engagement with local foodsheds to make visible the sacredness of creation. McGann further critiques the industrial food system and the disconnection of Eucharistic elements from their natural roots, advocating for sustainable, locally sourced bread and wine as sacramental signs of justice and care. For McGann, the Eucharist offers a transformative moral vision, challenging consumerist economies while inspiring communities to embody ecological justice, solidarity, and the healing of Earth through worship and daily life.

While McGann does not address artificial intelligence directly, her vision of ecological worship provides valuable insights for reflecting on how the Eucharist and other liturgical forms might engage the broader environmental impacts of AI systems. Her emphasis on interconnectedness, sustainability, and justice in worship challenges faith communities to consider how their practices can become more attuned to the ecological realities of our time. More studies and academic resources on the impact of AI and agriculture appear to be emerging as researchers increasingly examine the ways AI-driven technologies influence farming practic-

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27. Some titles include: Elochukwu E. Uzukwu, "Food and Drink in Africa and the Christian Eucharist," *African Ecclesial Review* 22:6 (1980): 370–385; Monica K. Hellwig, *The Eucharist and the Hunger of the World* (Kansas City, MO: Sheed & Ward, 1992); Lawrence E. Mick, *Liturgy and Ecology in Dialogue* (Collegeville, MN: Liturgical Press, 1997); Denis Edwards, "Celebrating Eucharist in a Time of Global Climate Change," *Pacifica* 19 (February 2006): 1–15; David N. Power, "The Eucharistic Table: In Communion with the Hungry," *Worship* 83: 5 (September 2009): 386–398; Timothy Hessel-Robinson, "Requiem for the Baiji: Liturgical Lamentation and Species Extinction," in *Spirit and Nature: The Study of Christian Spirituality in a Time of Ecological Urgency*, ed. Timothy Hessel-Robinson and Ray Maria McNamara (Eugene, OR: Pickwick Publications, 2011), 176–200; Catherine Vincie, *Worship and the New Cosmology* (Collegeville, MN: Liturgical Press, 2014); and Anne and Jeffery Rowthorn, *God's Good Earth: Praise and Prayer for Creation* (Collegeville, MN: Liturgical Press, 2018).
28. Mary E. McGann, *The Meal that Reconnects: Eucharistic Eating and the Global Food Crisis* (Collegeville, MN: Liturgical Press, 2020).

es, resource allocation, and sustainability within food systems.[29] Liturgical theologians could contribute to this emerging field by exploring how worship practices might symbolically and practically address the ethical and ecological dimensions of AI's role in reshaping humanity's relationship with creation.

SIX: Robots in Our Midst: Embodied AI in Worship Contexts

One of the dominant fears gripping our collective consciousness today is the existential anxiety surrounding robots taking over our world. These embodied forms of AI are already among us. For instance, robots have long been integral to the manufacturing sector, automating assembly lines and revolutionizing production efficiency. More recently, robots have taken on culinary roles, such as cooking and flipping burgers in White Castle restaurants.[30] Additionally, autonomous robots are increasingly being used in healthcare, assisting in surgeries with precision or delivering medications in hospitals, transforming patient care in unprecedented ways. Could such robots be embraced within worship settings? What theological questions might arise about their role in relation to human personhood and religious ritual? How might the presence of robots challenge or reshape our understanding of faith and relationality?

Broadly speaking, robots are "all entities that are built by humans to perform tasks on their own."[31] In a narrower understanding, "the term robot refers to technical entities that meet six conditions: they (1) are powered by a (usually electrical) energy source; (2) can use sensors, i.e., technical apparatuses for sensing their environment, to 'perceive' their environment; (3) manipulate it using effectors, i.e., technical apparatuses for acting on their environment; (4) move; (5) signal; and (6) are controlled by algorithms." It may surprise some to discover that robots are already being used in religious services. Two examples include:

- Ganapati Bappachi Robotic Aarti: This system of robotic arms performs liturgical movements in Hindu worship, such as ringing bells and waving candles in circular motions during the Aarti ritual in front of a Ganapati (Ganesha) statue.[32]

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29. Maaz Gardezi, Bhavna Joshi, Donna M. Rizzo, Mark Ryan, Edward Prutzer, Skye Brugler, and Ali Dadkhah, "Artificial Intelligence in Farming: Challenges and Opportunities for Building Trust," *Agronomy Journal* 116:3 (April 5, 2023): 791–1642, https://acsess.onlinelibrary.wiley.com/doi/epdf/10.1002/agj2.21353; Rosana Oliveira and Rogério Diogne de Souza e Silva, "Artificial Intelligence in Agriculture: Benefits, Challenges, and Trends," *Applied Sciences* 13:7405 (June 2023), https://www.researchgate.net/publication/371804884_Artificial_Intelligence_in_Agriculture_Benefits_Challenges_and_Trends.
30. https://www.youtube.com/watch?v=5vjf13h2f6o.
31. Jonas Simmerlein and Max Tretter, "Robots in Religious Practices: A Review," *Theology and Science* 22:2 (2024): 258.
32. Simmerlein and Tretter, 260: https://www.youtube.com/watch?v=wHpt37U5eq0.

- Pepper**:** This humanoid robot has been used in Buddhist funeral services in Japan, where it chants sutras, recites sermons, and provides live-streamed services for remote attendees.[33]

There have been notable examples of robots functioning outside traditional Christian services, with the most famous being BlessU2. This robot was introduced at the 2017 World Reformation Exhibition in Germany to provide blessings in a Christian context. Equipped with interactive capabilities, BlessU2 offered personalized blessings by reciting biblical verses, raising its arms, and displaying animated facial expressions. It delivered these blessings audibly and in printed form, catering to a diverse audience in multiple languages.[34] Over the course of the exhibition, BlessU2 blessed more than 10,000 people, sparking discussions about the role of automation in religious rituals and the evolving relationship between faith and technology.[35]

Robots such as these highlight how they are challenging traditional boundaries in worship by stepping into roles traditionally reserved for humans. While they can perform precise and repetitive rituals with efficiency, their integration raises questions about whether such rituals lose or gain meaning when performed by machines. Furthermore, their presence invites reflection on the evolving relationship between faith, embodiment, and technology, pushing communities to rethink what constitutes authentic worship.

I have yet to identify an example of robots being fully integrated into regular Christian worship services, as documented uses of robots in Christian contexts remain largely experimental, exhibitional, and limited to short-term pilots. However, digital technology has long played a significant role in Christian worship, serving as a tool to enhance liturgical practices and foster communal engagement.[36]

As we reflect on the role of robots in worship services, it is crucial to examine not only their capabilities but also the philosophical and ethical frameworks that

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33. Simmerlein and Tretter, 264: https://www.youtube.com/watch?v=FVobokmWqe8.
34. Demonstration of BlessU2: https://www.youtube.com/watch?v=JTK68l2BHtE.
35. Ilona Nord and Charles Ess, *Robotics in Christian Religious Practice: Reflections on Initial Experiments in This Field*, accessed December 21, 2024, https://www.zora.uzh.ch/id/eprint/232422/1/Robotics_in_Christian_Religious_Practice.pdf.
36. Anna Puzio, "Robot, Let Us Pray! Can and Should Robots Have Religious Functions? An Ethical Exploration of Religious Robots," *AI & Society* (December 11, 2023): 1–17, https://doi.org/10.1007/s00146-023-01812-z. Puzio writes, "Currently, within Christianity, a predominant technological skepticism prevails, resulting in the rejection of robotics." See Ricky Manalo, "At the Digital Banquet of the Lord: Part One: A Primer on Livestreamed Mass," *Pastoral Music*, online special edition, https://npm.org/wp-content/uploads/Ricky-Manalo_At-the-Digital-Banquet-of-the-Lord_Full.pdf; and "At the Digital Banquet of the Lord: Part Two: Principle Practices for Livestreamed Mass," *Pastoral Music* 45:1 (January 2021): 12–17; and Kyle Schiefelbein-Guerrero, Church After the Corona Pandemic: Consequences for Worship and Theology (Berlin: Springer Nature, 2023).

shape our perceptions and interactions with them. Heidi Campbell's essay, "Evoking and Creating Theological Dialogue Around the AI-Nonhuman-Other for the Sake of Our Human-Technological Future," addresses this need by rethinking our relationship with technology, particularly AI, from a theological and ethical perspective.[37] Drawing on Martin Buber's framework of I-It and I-Thou relationships, Campbell critiques the prevalent tendency to "other" technology, framing it as an objectified "It" devoid of mutuality. She argues that this *I-It-ification* of technology contributes to detachment and moral outsourcing, where responsibility for ethical decisions is deflected to others, particularly corporations and cultural systems.

Campbell contextualizes her argument by tracing the values underpinning technological development—efficiency, individualism, and progress—to the Fordist industrial model. This model, championed by Henry Ford in the early 20th century, emphasized the standardization of products, the intensification of labor through highly specialized and repetitive tasks, and the use of assembly lines to maximize productivity. While these principles revolutionized manufacturing, they also embedded a cultural mindset that prioritizes control, optimization, and mechanization over relational and communal values. Campbell suggests that this industrial ethos has seeped into how society approaches technological advancements like AI and robotics, often favoring efficiency and mastery over ethics and relationships. To counter this, she calls for a reframing of technological discourse to transcend the binary of I-It and foster I-Thou relationships with technologists and corporations.

She proposes a new conceptual category: the "intermediary nonhuman other," which resists ideologically charged terms like "cyborg" or "transhumanism." This framework aims to encourage dialogue that moves beyond overly simplistic narratives portraying technology as either utopian or dystopian. Instead, Campbell emphasizes the need to ground these discussions in ethical accountability and mutual understanding. By focusing on the relational and cultural contexts in which AI is developed and used, she highlights the importance of holding corporations accountable for their innovations and fostering meaningful engagement between humans and the nonhuman entities they create.

SEVEN: Embodied Hybridity: The Integration of AI with Human Bodies

Building on the concept of AI robots in liturgical spaces, what if we take it a step deeper to explore how technology *integrated within our very bodies* might shape the way hybrid human-technological selves participate in worship? How

37. Heidi A. Campbell, "Evoking and Creating Theological Dialogue Around the AI-Nonhuman-Other for the Sake of Our Human-Technological Future," in *Thinking Tools on AI, Religion, & Culture*, eds. Heidi A. Campbell and Pauline Hope Cheong (Digital Religion Publications, 2023), 22-25: https://eprints.soas.ac.uk/39897/1/Thinking%20Tools%20for%20AI%20Religion%20&%20Culture-FINAL.pdf.

might this integration reshape our understanding of what it means to be human during liturgy? What challenges and opportunities could arise when hybrid human-technology beings engage in communal liturgical practices? Ray Kurzweil's *The Singularity Is Nearer: When We Merge with AI* (2024) elaborates on his earlier predictions[38] about the transformative convergence of human intelligence and artificial intelligence, positing that exponential technological advancements will redefine human existence. Building on the Law of Accelerating Returns (LOAR), Kurzweil envisions breakthroughs such as nanorobots connecting human brains to the cloud, AI-driven cures for diseases, and the possibility of uploading consciousness to digital platforms by mid-century, all while addressing the profound ethical and societal challenges these changes will bring.

Kurzweil's vision, however, has not gone without critique. Philip Larrey contends that such transhumanist aspirations often reduce the human experience to computational processes, neglecting the spiritual and metaphysical dimensions of what it means to be human.[39] Transhumanism is the philosophical and scientific movement that seeks to transcend the biological limitations of human beings through advanced technologies.[40] Drawing on Aristotelian-Thomistic metaphysics, Larrey critiques the concept of "uploading consciousness," arguing for the unity of body and soul as foundational to human dignity. These critiques are particularly relevant when considering the theological implications of merging human consciousness with AI.

While debates about uploading consciousness persist, the integration of augmented reality (AR) and virtual reality (VR) technologies *into* human bodies appears

38. Ray Kurzweil's recent work directly references his earlier book, *The Singularity Is Near: When Humans Transcend Biology* (New York: Viking, 2005). Other titles include *The Age of Intelligent Machines* (Cambridge, MA: MIT Press, 1990); *Fantastic Voyage: Live Long Enough to Live Forever*, co-authored with Terry Grossman (New York: Penguin, 2005); and *How to Create a Mind: The Secret of Human Thought Revealed* (New York: Viking, 2012).
39. Philip Larrey, *Artificial Humanity: An Essay on the Philosophy of Artificial Intelligence* (Rome, Italy: IF Press, 2019).
40. Larrey, 85 -106.

more plausible in the near future.[41] Kurzweil envisions a world where immersive sensory experiences no longer require external devices, such as head-mounted displays, motion controllers, or smartphones, but instead, are seamlessly integrated into human biology. By the 2030s, he predicts nanotechnology will interface directly with the human nervous system, enhancing intelligence and creativity while expanding the boundaries of human interaction. These transformations hold profound implications for how worshippers might engage in liturgical spaces, both physically and virtually.

Teresa Berger's exploration of digitally mediated worship in *@Worship* provides a helpful lens for considering these possibilities.[42] While Berger focuses on AR/VR technologies used primarily in online worship, her insights reveal how digital mediation challenges traditional distinctions between "real" and "virtual" presence. Connecting her work to Kurzweil's vision suggests a future where immersive technologies, integrated directly into our bodies, could transform our sense of physical church spaces. Imagine a Eucharistic celebration where worshippers can "see" hymn lyrics or sacred texts subtly projected within their field of vision without the need for external hymnals or projected screens. Liturgical art and lighting could dynamically adapt to the liturgical season, creating a fully immersive and contextually rich environment. Soundscapes could be tailored so that the presider's voice, the cantor's melody, and the resonant harmony of a virtual choir envelop each participant, creating an acoustically perfect experience—all while the worshippers remain physically present in the church. Such technology could profoundly enhance the sensory and spiritual dimensions of communal worship, offering new ways to encounter the sacred. This convergence of embodied and virtual participation would not only reconfigure traditional understandings of

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41. Augmented reality (AR) and virtual reality (VR) are two distinct but related technologies that have gained significant attention in recent years. According to a comprehensive survey by Ronald T. Azuma, augmented reality is defined as a technology with three key characteristics: it combines real and virtual elements, it is interactive in real time, and it is registered in 3-D. AR allows users to see the real world with virtual objects superimposed upon or composited with it. Unlike virtual reality, which completely immerses a user in a synthetic environment, AR supplements reality rather than replacing it entirely. See Ronald T. Azuma, "A Survey of Augmented Reality," *Presence: Teleoperators and Virtual Environments* 6:4 (August 1997): 355–85, https://www.cs.unc.edu/~azuma/ARpresence.pdf.

    Virtual reality (VR), on the other hand, is defined as "a computer-generated, three-dimensional virtual environment that users can interact with, typically accessed via a computer that is capable of projecting 3D information via a display, which can be isolated screens or a wearable display, e.g., a head-mounted display (HMD), along with user identification sensors." See Ayah Hamad and Bochen Jia, "How Virtual Reality Technology Has Changed Our Lives: An Overview of the Current and Potential Applications and Limitations," *International Journal of Environmental Research and Public Health* 19:11278 (September 8, 2022), https://pmc.ncbi.nlm.nih.gov/articles/PMC9517547/. VR systems completely immerse users in a synthetic environment, blocking out the real world. They are characterized by the ability to explore and manipulate computer-generated environments, real-time interactivity, and immersion in a 3D world.

42. Teresa Berger, *@Worship: Liturgical Practices in Digital Worlds* (New York: Routledge, 2018).

presence and community but also raise profound theological and pastoral questions about how these hybrid selves interact within liturgical spaces.[43]

EIGHT: AI, Posthumanism, and the Expanding Horizons of Sacramental Worship

At the beginning of this paper, I offered a definition of AI by IBM that primarily utilizes a technological and utilitarian perspective: "technology that enables computers and machines to simulate human learning, comprehension, problem-solving, decision-making, creativity, and autonomy." This definition represents the dominant framework within computer science, engineering, and related applied fields, focusing on AI as a tool to enhance efficiency and simulate human cognitive functions. In this final trajectory, I turn to two theologians—Ilia Delio and Catherine Vincie—whose distinct but complementary perspectives expand the conversation toward posthumanism, sacramental theology, and cosmic relationality. I begin with Ilia Delio, who offers a more provocative and integrative perspective on AI by viewing it not merely as a technological tool, but as part of an evolutionary and theological process that reimagines human identity, relationality, and the cosmos itself.[44]

Delio approaches AI from the intersection of science and theology, integrating evolutionary thought with spiritual and ethical reflection. Unlike technological definitions that emphasize human-like functions or utilitarian goals, Delio sees AI as part of the universe's ongoing evolution toward greater complexity, relationality, and wholeness. Her perspective is deeply informed by posthumanism, which she describes as a transformative shift in human identity where boundaries between humans, machines, and the environment blur, emphasizing distributed consciousness and the deep relationality of existence. For Delio, posthumanism moves beyond the Enlightenment ideal of the autonomous individual to a vision of identity as fluid, relational, and co-creative. Within this framework, the inte-

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43. An example of some hesitation regarding technological advancements in liturgical music can be drawn from the guidelines issued by the Committee on Divine Worship of the United States Conference of Catholic Bishops (USCCB), *Sing to the Lord: Music in Divine Worship* (2007), which states:

> 93. Recorded music lacks the authenticity provided by a living liturgical assembly gathered for the Sacred Liturgy. While recorded music might be used advantageously outside the Liturgy as an aid in the teaching of new music, it should not, as a general norm, be used within the Liturgy.
> 94. Some exceptions to this principle should be noted. Recorded music may be used to accompany the community's song during a procession outside and, when used carefully, in Masses with children. Occasionally, it might be used as an aid to prayer, for example, during long periods of silence in a communal celebration of reconciliation. However, recorded music should never become a substitute for the community's singing.

Written in 2007, these guidelines were likely composed without anticipating the advent of AI tools. It may be time for an update.

44. Ilia Delio, *Re-enchanting the Earth: Why AI Needs Religion* (Maryknoll, NY: Orbis Books, 2020).

gration of humans and machines is not a disruption but a natural extension of the interconnected processes that define life and the cosmos.[45]

Delio thus views AI as a natural progression of the universe's drive toward complexity and interconnectedness. Her vision reframes AI as a catalyst for redefining human identity and purpose. She envisions a "hyper-connected" posthuman being, where identity emerges through dynamic relationships with technology, nature, and others. This perspective emphasizes that intelligence and consciousness are not confined to individual autonomy but are distributed across networks of relationships. As a tool, AI could enhance humanity's capacity for this expanded relationality, provided it aligns with ethical and spiritual principles, fostering collective flourishing and ecological harmony. The final paragraph of her book encapsulates well the role of AI within this expansive framework:

> Technology can improve our lives, but more so, it can move us toward new wholes if it is aligned with a center of compassionate love, a divine center within us and around us, an energy field of love upon which all religious personalities can ultimately converge. Can we create Al to deepen religious energies of love? Can Al mediate an ethics of compassion for planetary life? . . . Our most urgent task is to realize that the earth is holy, sacred, and lovable because it is porous, permeable, and open to the endless depth and horizon of life we call God. Posthuman life must become planetary life if we are to have a sustainable future. . . . It is time to awaken to a new second axial religion where super-intelligence can become super-love, not information but transformation for a new future together, a new rising in our midst.[46]

While Delio does not address liturgical worship directly, her section on "religion as performance" hold significant implications.[47] She reimagines religion as a performative act rather than a static adherence to doctrines or dogmas. Critiquing the abstraction and lack of coherence in institutional religion, Delio argues that religion must align with modern understandings of physics, evolution, and relationality. Drawing on Judith Butler's concept of gender performance, Delio suggests that religion is not something one inherently "is" but something one becomes through repeated acts, rituals, and devotions. Practices such as lighting candles, reciting the rosary, or kneeling before the Blessed Sacrament are not merely symbolic but constitutive of religious identity and connection.[48]

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45. For an overview of posthumanism, see Ch. 6 of Delio, *Re-Enchanting the Earth,* 113-131.
46. Delio, 225.
47. Delio, 196-198.
48. Delio, 196-197. She writes: "Judith Butler's gender performance opened new doors of understanding gender as enactment and thus gender as art. 'Gender is performative,' she writes, 'a stylized repetition of acts, in which bodily gestures, movements, and styles of various kinds constitute the illusion of an abiding gendered self.' Her anti-essentialist position basically holds that one becomes a gendered person by acting as a gendered person. The same argument could be made for religion." Judith Butler, *Gender Trouble: Feminism and the Subversion of Gender* (London: Routledge, 1990), 137.

Delio emphasizes that performative religion is dynamic and creative, enabling individuals to construct meaning and enact values that promote life and unity. This act of performance is a feedback loop where values from ancient traditions, such as those found in the Gospels or mystical teachings, inform present actions, which in turn shape the self and community. In this framework, religion becomes an ongoing act of "doing God" or "doing Christ," where divine presence is incarnated through acts of love, creativity, and transcendence. Such performative acts transform not just individuals but also the collective, fostering resilience and openness to future possibilities.

Building on Delio's earlier works—*Christ in Evolution* (2008) and *The Emergent Christ* (2011)—Catherine Vincie develops a liturgical and sacramental theology in *Worship and the New Cosmology* (2014)[49] that is rooted in an ecological and evolutionary worldview. Vincie adopts Delio's Christology, among others, to emphasize relationality, interconnectedness, and the sacramental nature of the cosmos as integral to liturgical praxis. In Chapter 6, she explores the profound implications of the new cosmology for sacramental theology and practice. She proposes four frameworks:[50]

- *Cosmic Sacramentality:* Sacramentality must expand beyond traditional boundaries to encompass the vastness of the cosmos, including the immense scale, complexity, and age of the universe. Every aspect of creation reveals and embodies God's care and communication, emphasizing that nothing lies outside God's desire for revelation.
- *Materiality and Embodied Sacramentality*: Sacramentality demands a deeper acknowledgment of human materiality and the materiality of ritual objects. Humans, as embodied spirits, experience and interact with the world through their physicality, sharing a profound connection with all living forms and their environments.
- *Sacrament as Blessing and Response:* Sacraments are formed through the dynamic interaction of God's blessing and humanity's response. This process, rooted in the origins of the universe, extends to all creation, where every being holds the potential to respond sacramentally to God's blessing.
- *Sacramentality and Ethics:* Sacramentality connects deeply with ethical responsibility, recognizing humanity's shared origins and destiny in Christ with all creation. This relationship calls for solidarity with marginalized persons and the oppressed environment, urging action for liberation and the fullness of life.

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49. Ilia Delio, *Christ in Evolution* (Maryknoll, NY: Orbis Books, 2008); Ilia Delio, *The Emergent Christ* (Maryknoll, NY: Orbis Books, 2011); Catherine Vincie, *Worship and the New Cosmology* (Collegeville, MN: Liturgical Press, 2014).
50. Vincie, 85-88.

Vincie's sacramental theology resonates with Delio's focus on relationality and interconnectedness, expanding liturgical praxis to embody a deeper solidarity with creation. Both thinkers call for worship to move beyond individualism, envisioning it as a transformative act that aligns with the evolving universe and fosters a renewed commitment to ecological and cosmic harmony. While Vincie does not explicitly address AI, Delio's exploration of AI in *Re-Enchanting the Earth* as a catalyst for relationality and cosmic evolution could enrich Vincie's framework. AI, seen within this sacramental vision, becomes a tool to deepen humanity's interconnectedness with creation and foster the transformative, relational nature of worship in alignment with the universe's unfolding complexity.

Conclusion

The difficulty of writing about technology lies in its ever-accelerating pace, where today's innovations can become obsolete within months. Yet, given the exponential integration of artificial intelligence into mainstream practices—particularly in the United States, which leads the world in its development and adoption—this paper's exploration holds relevance for the present and offers a foundation for ongoing dialogue. AI is no longer a distant possibility but an increasingly pervasive reality, requiring liturgical theologians and pastoral ministers to address its implications with both urgency and foresight.

This paper charted a progression from the immediate to the expansive, beginning with AI's tangible impact on liturgical practices such as text generation, artistic innovation, and music composition. From these practical applications, the discussion broadened to consider AI's cultural and ecological dimensions, examining how it shapes human relationships with tradition, diversity, and the environment. Moving further, the focus turned to questions of embodiment and relationality, exploring the presence of robotics and hybrid human-technology identities within liturgical spaces. Finally, the exploration concluded with a theological and cosmic vision, framing AI not merely as a tool but as a transformative force within the evolving universe. This trajectory wove together the practical and the speculative, inviting a holistic engagement with AI that invites us to embrace new possibilities.

Artificial intelligence invites worship communities not only to address its ethical and practical implications but also to imagine its potential as a theological frontier. This frontier challenges us to balance ancient liturgical wisdom with innovative practices, ensuring that technology serves as a tool for human flourishing rather than an end in itself. This trajectory invites liturgical theologians and ministers to engage with AI critically and creatively, envisioning worship that embraces innovation while safeguarding its spiritual integrity. By doing so, worship communities can shape a future where the sacred and the digital intertwine meaningfully, upholding the dignity of liturgy and illuminating the divine mystery in ways both ancient and new.