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Introduction

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A GOLDEN AGE OF AI?

In 2019, Amazon launched re:MARS, a "global AI event for Machine Learning, Automation, Robotics, and Space." Amazon founder Jeff Bezos claimed in the announcement for the event, "We're at the beginning of a golden age of AI. Recent advancements have already led to invention that previously lived in the realm of science fiction—and we've only scratched the surface of what's possible." "We're excited to create re:MARS," he added, "to share learnings and spark new ideas for future innovation." Like its invitation-only predecessor MARS, which began three years earlier, re:MARS "embraces an optimistic vision for scientific discovery to advance a golden age of innovation."[1]

Since the term was coined in the 1950s, artificial intelligence has been associated with efforts to imitate human intelligence. Artificial intelligence systems increasingly perform complex tasks comparable to and even exceeding those that require human intelligence, but computer processing only superficially resembles human decision-making and action. As Gary

1. Amazon, "We're at the Beginning of a Golden Age of AI."

Smith points out in *The AI Delusion*, "Human minds are not computers, and computers are not human minds."[2] Given our limited understanding of human cognition and other qualities associated with modern humans such as consciousness, the human mind has so far provided a limited model for accomplishing computational goals. This is why, paralleling aspirations for human-like AI, there is a complementary history of intelligence augmentation. While early AI pioneers were struggling to imitate the human mind and body, other computer scientists were developing technologies that would lead to the invention of the personal computer and computer networking.[3]

According to Joanna Bryson, "The past decade, and particularly the past few years, have been transformative" for AI.[4] Digital information and communication technologies—the internet and cloud computing, social media and big data, mobile devices and sensors—have increased what is possible with automated and autonomous data processing for computer perception, analysis, and behavior. Today, Mariarosaria Taddeo and Luciano Floridi describe AI as "a growing resource of interactive, autonomous, self-learning agency" that is "reshaping daily practices, personal and professional interactions, and environments."[5] Artificial intelligence has become one of the most powerful and pervasive technologies in our lives. Many of us interact with AI-enabled digital assistants such as Amazon's Alexa daily, connecting us with a complex network of surveillance and decision-making systems. And most AI developers seem to be avoiding what Daniel Susskind describes as the "'AI fallacy': the mistaken belief that the only way to develop machines that perform a task at the level of human beings is to copy the way that human beings perform that task."[6] The AI technologies showcased at re:MARS 2019—recommendation systems for purchases, prediction systems for the fulfillment and delivery of purchases, robots sorting and moving packages in warehouses, and everything that enables Alexa to respond to and anticipate customer inquiries—are impressive systems that accomplish a variety of specific goals. But, as Bezos admits, "we're still a long way from being able to have machines do things the way humans do things."[7] Or, one might add, possessing anything analogous to the creativity

2. Smith, *AI Delusion*, 33.
3. See Markoff, *Machines of Loving Grace*, 5–18.
4. Bryson, "Past Decade and Future of AI's Impact on Society," 128.
5. Taddeo and Floridi, "How AI Can Be a Force for Good," 751.
6. Susskind, *World without Work*, 71.
7. Bezos, *Invent and Wonder*, 213.

and imagination that Walter Isaacson says "makes someone a true innovator" like Bezos.[8]

For many, though—especially those influenced by popular representations of robots and other artificial entities—human-level or general intelligence remains the "holy grail" of AI development and the "real" goal of AI.[9] This goes beyond designing systems to model specific human-like capabilities, such as vision, language, reasoning, and learning. The idea of artificial general intelligence (AGI) is that it would be able to master everything of which human intelligence is capable—and then surpass it, becoming superintelligent (artificial superintelligence, or ASI). Whether or not AGI and ASI are possible is a matter of speculation and debate, and different positions reveal competing beliefs about AI and humans. As Byron Reese points out, "experts disagree not because they know different things, but because they believe different things."[10] Floridi characterizes the extreme positions as "AItheist" and "Singularitarian": the belief that AI is just a sophisticated form of regular computing, or the opposing belief that AI will surpass human intelligence at some point (this is one version of the "singularity") and then continue to develop on its own—which could be great or terrible, depending on whether or not ASI is aligned with our values.[11] Artificial intelligence experts can be found at either extreme, and everywhere in between them.

AI AND THE FUTURE

In a keynote at re:MARS 2019, a senior Amazon executive described a library in one of Bezos's homes:

> There are two fireplaces that face each other. On one side of the library, over the fireplace, he has the word Builders, and under that is all of the books in his collection that are authored by builders. And on the other side of the library, it says Dreamers and he has books by Dreamers. This is a very good representation of what we are trying to do here—to bring together the builders and the dreamers—as we envision the future.

8. Isaacson, introduction to Bezos, *Invent and Wonder*, 1.

9. Stuart Russell quoted in Ford, *Architects of Intelligence*, 48.

10. Reese, *Fourth Age*, x.

11. Floridi, "Singularitarians, AItheists, and Why the Problem with Artificial Intelligence Is H.A.L. (Humanity At Large), Not HAL," 8–11.

When asked the next day about the inscriptions over his library fireplaces, Bezos pointed out how human creativity needs both dreamers and builders: "The dreamers come and the builders get inspired by them. And the builders build a new foundation that the dreamers can stand on and dream more." Amazon's artificial agent Alexa, he noted, was inspired by the *Star Trek* computer.[12]

The AI technologies being created and imagined today raise ethical questions about data curation, algorithmic agency, social inequities, and the future of every dimension of life. The actual and anticipated applications of AI also inspire a range of hopes and fears. Some imagine optimistic and utopian futures in which AI will solve known problems and create a superior form of life. Other imagined futures are more pessimistic and dystopian, with AI exacerbating old problems and creating new ones. The most extreme anticipations and anxieties include visions of an earthly paradise, posthuman immortality, and the end of the human species and civilization. AI has been called "the Second Coming and the Apocalypse at the same time."[13]

In addition to becoming part of our lives, AI is increasingly part of our cultural narratives. Hopeful narratives expect AI to increase production and prosperity, eliminate hunger and poverty, and find innovative solutions to health, energy, ecological, and economic challenges. By solving these problems, AI could lead us into a more fulfilling, peaceful world and create more opportunities for human creativity, discovery, relationships, and rest.[14] For Singularitarians, AGI and ASI inspire hopes for an enhanced and extended human or even posthuman life.[15] Chief among these optimists is Ray Kurzweil, who believes AGI will be achieved by 2029. Kurzweil imagines that "we're going to merge with the intelligent technology that we are creating." First our lives will be extended biologically, through improved biotechnology, and then they will be extended digitally.[16] Max Tegmark, another prominent AI optimist, claims AGI "can enable us to finally become

12. Bort, "Jeff Bezos Explains Why the Library in His House Has Two Fireplaces with Two Inscriptions."

13. Brockman, *Possible Minds*, xv.

14. See, e.g., Reese, *Fourth Age*, 283–303.

15. The meaning and use of the term posthuman is complex and contested, but in transhumanism it often refers to the idea of an uploaded form of existence. See J. Hurlbut and Tirosh-Samuelson, eds., *Perfecting Human Futures*, 8. The other major use of the term refers to a cyborg or hybrid understanding of human nature. See Thweatt-Bates, *Cyborg Selves*, 1–5.

16. Quoted in Ford, *Architects of Intelligence*, 238–39.

the masters of our own destiny," to upgrade life to a form that is substrate-independent, and to free life "from its evolutionary shackles."[17]

Fearful narratives about AI include anxieties about bias and fairness, transparency and accountability, security and surveillance, autonomous weapons, and adverse uses.[18] When uncertainties about AGI and ASI are added to these—especially about possibilities of an intellect that can be independent of ours, a "mind out of place"[19] with unknown aims[20]—even the optimistic Tegmark can imagine more dystopian than utopian outcomes, and he admits that his utopian scenarios "involve objectionable elements."[21] "If our technology outpaces the wisdom with which we manage it," he admits, "it can lead to our extinction."[22] Nick Bostrom explains that if AI systems are not engineered "so that they are an extension of human will," with behaviors shaped by "our intentions," then we may "get a future shaped in accordance with alien criteria . . . random, unforeseen, and unwanted."[23] Our artificial creatures may rebel, like Victor Frankenstein's or the machines in *The Matrix* franchise, or we may end up with the entire material world wholly appropriated to optimize the production of something banal such as paperclips. Margaret Boden claims that "near-apocalyptic visions of AI's future are illusory." "But," she adds, "partly because of them, the AI community—and policy-makers and the general public, too—are waking up to some very real dangers."[24]

At present, an ethical consensus appears to be emerging around major areas of concern such as beneficence, non-maleficence, autonomy, justice, and the explicability of AI—although challenging philosophical, technical, and organizational questions remain about defining and operationalizing such broad values.[25] There is also growing awareness of the social inequities perpetuated and created by AI: as Ruha Benjamin points out, technologies that "often pose as objective, scientific, or progressive, too often reinforce racism and other forms of inequity."[26] And many of Amazon's logistical al-

17. Tegmark in Brockman, *Possible Minds*, 87; Tegmark, *Life 3.0*, 25, 29, 55.

18. Anderson et al., "Artificial Intelligence and the Future of Humans."

19. Singler, "Existential Hope and Existential Despair in AI Apocalypticism and Transhumanism," 170.

20. Morelli, "Athenian Altar and the Amazonian Chatbot," 187.

21. Tegmark, *Life 3.0*, 161–202. Tegmark imagines twelve scenarios, only a few of which could be classified as utopian.

22. Tegmark, "Let's Aspire to More than Making Ourselves Obsolete," 76.

23. Quoted in Ford, *Architects of Intelligence*, 98.

24. Boden, *AI*, 169.

25. Floridi et al., "AI4People," 689–707.

26. Benjamin, *Race after Technology*, 1.

gorithms are being scrutinized and criticized for how they manage human bodies and behaviors. Some agreements may be coalescing around many generally shared concerns related to data collection and privacy, attentional manipulation and autonomy, information authenticity and trustworthiness, and algorithmic bias and transparency.[27] But as we make progress toward realizing ethical and beneficial AI, further "foresight analysis" must be done not only of what is possible with AI but also of what is desirable.[28] We need to be discussing, imagining, and constructing better narratives about the future world we want to create.

AI AND FAITH

We are only beginning to understand and imagine what human attention, autonomy, and agency should look like in a world full of artificial and autonomous agents. James Williams worries about preserving our ability to give attention to what matters most when we are functionally, existentially, and epistemically distracted by algorithms that are not aligned with and can overwhelm our intentions.[29] Brett Frischmann and Evan Selinger caution about losing our human autonomy and agency: As we design new autonomous systems, are we also redesigning ourselves in such a way that we are surrendering our independence and outsourcing our responsibility? "What meaningfully distinguishes *Homo sapiens* from all other species is our capability to imagine, conceptualize, and engineer ourselves and our environment," they argue. Our humanity "is reflected in us and our built world of imagined realities, institutions, infrastructures, and environments," but we need to be attentive to how our identities, actions, societies, and world can be controlled, conditioned, and constrained by our own creations.[30] Ultimately, Yuval Harari admits, we need better imaginative narratives to inform not just technological development but our development as a species.[31]

Tom McLeish articulates well how theology can help open up our imagination. "Because theology observes and construes stories," he says, it can help us identify "shared experiences of creativity and constraints." Further, theology "is able to discuss purposes and values—it can speak of, and

27. Anderson et al., "Artificial Intelligence and the Future of Humans."

28. Floridi, "Soft Ethics, the Governance of the Digital, and the General Data Protection Regulation."

29. Williams, *Stand Out of Our Light*, xii, 50–68.

30. Frischmann and Selinger, *Re-engineering Humanity*, 271.

31. Harari, *Homo Deus*, 21–22, 155–78.

ground, 'teleology.'"[32] Technology is teleological, designed for certain *teloi* (Greek: "ends"), and these ends or goals are, consciously or not, embedded in cultural narratives about broader values and purposes. The shared *telos* of Christians, new creation, anchors a robust narrative that can provide critical distance from competing narratives about the ends of technology and the societies shaping it. The Christian narrative about new creation also can help us align our attention and agency with shared goals and actions.[33]

For millennia, faith traditions have at different times directed, supported, and resisted technological progress, providing ethical foundations and narrative frameworks for either affirming or rejecting new technologies. Religious deliberations surrounded information technology developments such as writing, libraries, the printing press, and popular media, and over time religious perspectives have often influenced how such innovations became characteristic of human life as we now know it. While each of these innovations profoundly changed humans and how we interact with the world, AI captures our imagination in ways that center fundamental questions about our identity, agency, and destiny as a species. These are primordial questions, and faith traditions have curated ancient wisdom that can help us reflect on how we may shape the future with AI. Increasingly, different faith perspectives are focusing on AI. But, as Calvin Mercer and Tracy Trothen point out in their textbook on religion and the technological future, "academics in all disciplines, as well as the general public, are still in the very early stages of understanding, much less responding to" the impacts of transformative technologies such as AI.[34]

The rapid adoption of AI is disorienting, socially disruptive, and requires dialogue with diverse disciplines and groups impacted by it. Microsoft's Brad Smith notes that "a global conversation about ethical principles for artificial intelligence will require . . . seats at the table not only for technologists, governments, NGOs, and educators, but for philosophers and representatives of the world's many religions."[35] On one hand, the broad attention being given to questions of AI ethics and societal impact is encouraging—and in many ways is unprecedented. Many technologies are developed and implemented over long periods of time, and hazards and social regulations emerge slowly. With AI, corporations and activists are calling for regulation and accountability before further implementation of controversial applications such as facial recognition. On the other hand, the range

32. McLeish, *Faith and Wisdom in Science*, 214, 248.

33. See Paulus et al., "Framework for Digital Wisdom in Higher Education," 43–61.

34. Mercer and Trothen, *Religion and the Technological Future*, 4.

35. Smith, *Tools and Weapons*, 208.

of knowledge and wisdom from which expertise must be drawn—technical and legal, from the humanities and social sciences, and from those who will be most adversely impacted—is daunting. No one tradition, government, discipline, organization, or group can exhaust the questions that need to be asked and the responses that need to be pursued to integrate AI into our lives and world well and wisely. Of making many books about AI—and organizational principles, professional codes, and legal regulations—there will be no end.

This book presents a multidisciplinary range of perspectives on AI from the standpoint of Christian faith. While this is not the first book to explore the intersection of AI and faith, it is among the first to advance this exploration by approaching this emerging technology from a group of Christian scholars from various disciplines—Business, Computer Science, Education, Information Studies, Neuroscience, Philosophy, and Theology—who have been studying AI together. This research collaboration began in early 2019, when four founding members of AI and Faith—a consortium of faith communities and academic institutions bringing the values of the world's major religions into discussions about the ethical development of AI[36]—decided to form a faculty research group at Seattle Pacific University, a Christian research university, to explore the present and future impacts of AI from various disciplinary perspectives as well as the perspective of Christian faith. With support from former provost Jeff Van Duzer and generous funding from Keri and Eric Stumberg, the seven members of this group met regularly throughout the 2019–2020 academic year to study and discuss AI, faith, and the future. This book, a culmination of those discussions, seeks to provide a scholarly but accessible foundation for facilitating further ethical and theological explorations of AI.

This book is organized into two sections. Following this introduction, the first section includes three additional orienting essays. This first is a historical and technical introduction to AI, providing a narrative about its development, an explanation of various technologies related to AI, and a consideration of potential futures for AI. This essay is a resource for understanding terms and technologies associated with AI. The next essay provides a philosophical framework that helps to clarify key concepts at work in discussions of the pragmatic and ethical issues related to AI. After all, what sort of entity a thing is grounds what it can do and establishes its moral status. The final essay in this section is an introduction to key theological themes touched on in this book, as well as a discussion of the types of questions uniquely addressed by theology. The doctrinal lenses of revelation, creation,

36. See https://aiandfaith.org.

salvation, and eschatology here provide key perspectives for theological reflection on the nature and use of AI.

The second section offers a series of disciplinary and theological reflections on the impact of AI. "Artificial Intelligence and Theological Personhood" explores theological insights from Genesis, the incarnation, and Pentecost to discern the nature of human and artificial personhood. By tracing theological themes from these biblical accounts, the chapter suggests how we might imagine the nature and role of AI within Christian understandings of creation, covenant, and vocation. "Reinforcement in the Information Revolution" explains current dynamics at the intersection of neuroscience and AI—with particular attention given to developments tied to commercial interests—along with strategies of resistance based in Anabaptist practices. The potential role of AI to enhance education is discussed in "21st Century Learning Skills and Artificial Intelligence." This essay explores the cultivation of creativity, critical thinking, communication, and collaboration in connection with AI, as well as the theological significance of the imagination and community. "Automation and Apocalypse: Imagining the Future of Work" provides a brief history of work, technology, and the theology of work, and explores three views of AI and the future of work through a literary dystopia, a philosophical utopia, and a theological apocalypse. In the apocalyptic view of work presented here, it is possible to imagine AI participating in new creation. The final reflection, "Sin and Grace," presents guiding principles for wise engagement with AI. The theological lenses of sin and grace open our eyes to the spiritual reality of sin, the outworking of God's redeeming grace, and our role in participating in the transformation of the world. The book concludes with a prayer, "A Litany for Faithful Engagement with Artificial Intelligence," as a responsive act of worship meant to help focus and guide our response to AI. Our hope is that this litany will serve as a practical guide for thoughtful prayers for wisdom and discernment, and in the daily disciplines of spiritual growth.

CONCLUSION

For those worried about AI, Oren Etzioni recommends spending some time talking to Alexa. That may temper hopes and fears associated with AGI or ASI, but an attendee of Amazon's voice developer conference Alexa Live 2020—another optimistic visioning event, this time held in the midst of a global pandemic and other social crises—would have been impressed with the exhibition of human ingenuity and technological infrastructure that is accelerating the development and deployment of AI. Although it is less than

a decade old, over 10,000 Amazon employees are working on Alexa along with over 750,000 developers around the world who are creating new capabilities every day. Over 100 million Alexa-enabled devices have been sold and connected with over 100,000 devices in homes, workplaces, automobiles, and elsewhere, and for many Alexa has become a primary information processing interface and an indispensable part of daily life. And Alexa executives say they are just getting started; more human-like capabilities are being developed to shift "cognitive burdens" from customers to Alexa and to make Alexa "part of our social fabric."[37]

Alexa's name, or "wake word," which Amazon has controlled commercially since 1999, is an homage to the Library of Alexandria—the famed ancient library built by the Ptolemies to establish their city as a center of political and cultural power.[38] Like a library, Alexa is an interface for accessing and engaging with information. But libraries, from Alexandria to every local public library today, have been primarily shaped by humans selecting and mediating information to cultivate human attention and agency. Even as libraries have increasingly automated operations, including with AI, there remains a priority for human interaction and scale informed by community and professional values. A proper library provides a generative human space where storytellers, dreamers, builders, and others come together to envision and create a better future. The role of an artificial agent such as Alexa, an assemblage of AI applications partnering with other globally networked AI applications, needs to be situated within constructive narratives about human nature, identity, purpose, and flourishing. The contents of this book provide a number of insights that can contribute to such narratives.

More than a decade ago, Floridi observed that our information society "is like a tree that has been growing its far-reaching branches much more widely, hastily, and chaotically than its conceptual, ethical, and cultural roots. The lack of balance is obvious and a matter of daily experience." "It's high time," he added, "to anticipate difficulties, identify opportunities, and resolve problems."[39] In addition, as Benjamin points out, our advanced information society still includes too much "suffering and injustice," and "we cannot resign ourselves to this reality we have inherited. It is time to reimagine what is possible."[40] The authors of this book hope it will facilitate further reflections and dialogue about AI to help us reimagine and pursue what is possible and necessary for a better world. Although the perspectives

37. See "Alexa Live 2020."
38. Romano, "Five Years Ago Amazon Introduced Alexa."
39. Floridi, *Information*, 7–8.
40. Benjamin, *Race after Technology*, 1.

of individual contributors about the future of AI may vary, we present here a shared vision for the value of engaging with resources from the Christian tradition to critique and participate constructively in the wise design, development, and use of AI.

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