

Catholic Viewpoints on Thinking Machinery

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Abstract

The discovery of an efficient means of simulating mental processes raises a variety of philosophical and theological questions. In this paper, we survey historical Catholic contributions and contemporary attitudes towards intellectual automation. In contrast with predominant secular views, we argue the development of thinking machines is not only compatible with the Catholic faith, but offers a more nuanced understanding of the relation between spirit and flesh. We survey historical and contemporary Catholic perspectives on thinking machinery, and how they inform our understanding of intelligence and the limits of computation.

1 Introduction

Catholics have long contributed to the study of computer science, dating back to at least the early 6th century. The *computus* was originally developed to calculate the date of Easter in relation to Passover and the vernal equinox.

In the 16th century, early Catholic astronomers such as **Copernicus** and **Galileo** used computational methods to predict the motion of celestial bodies, and developed telescopes to more carefully observe their orbits. Modern computers have been likened to telescopes in helping us to peer at distant truths and empirically study natural laws. As more powerful telescopes began to displace the prevailing geocentric perspective, so too have computers sharpened man's understanding of cognitive processes and unveiled some of the mysteries of anthropological exceptionalism.

Initially considered a challenge to geocentrism, the telescope and paradigm shift it ushered helped us to realize a deeper appreciation for the enormity of God's creation and our special place within it as the legatees to Christ's mission on Earth. Yet, a tension remained between the triumph of humanity against all odds, and the humility of our physical stature amidst a vast and indifferent universe. Today, we are faced with a similar conundrum as we grapple with the implications of thinking machinery and our ability to recreate aspects the human mind in computational form.

In anticipation of the dawning physicalism of the modern age, **René Descartes**, a Catholic philosopher, developed a dual theory of mind and matter as separate substances. Descartes' analytic geometry inspired both Leibniz and Newton, whose later work on differential calculus laid the foundation for gradient descent. Today, the echoes of Cartesianism can be heard in the two schools of neural and symbolic AI, which contemplate a similar duality between the geometric and algebraic, materialist and idealist forms of intelligence.

At the heart of Cartesian theories was the recognition that physical processes not only obeyed rational laws, but mental processes could be physically engineered. So began a centuries-long project to realize those ambitions by enlisting physics to do our thinking, culminating in what modern programmers would recognize as computers and AI.

A Catholic mathematician and contemporary of Descartes, **Blaise Pascal**, developed one of the earliest calculators, the Pascaline, to automate taxes. An avid theologian, the basis for Pascal's beliefs are argued in his *Thoughts* and *Discourse on the Machine* wherein his famous wager on God's existence can be found. The theory of probability he developed was highly influential on modern AI and both the programming language and a semiconductor architecture powering the first wave of deep learning now bears his name.

Essential to the success of computationalism was a theory of language. **Ludwig Wittgenstein**, a 20th century Catholic philosopher and pioneer of ordinary language philosophy, introduced the theory of language games which continues to mystify and inspire AI experts. His work on languages and mathematical logic left an indelible mark on computer science and linguistics. Like Pascal, Wittgenstein was a fideist and worldly academic who took great interest in philosophy and theology. His work has been cited as a precursor to the vector space model of language, which informs our modern understanding of large language models.

Fr. Georges Lemaître, a Belgian priest and physicist, first proposed the Big Bang, a theory of cosmological expansion that was later empirically tested and accepted, in 1932. Lemaître was an early adopter of computer technology to study the interaction between charged particles and Earth's magnetic field, among other cosmological phenomena, and was instrumental in early computing education in Belgium. Like many of his Catholic predecessors, Lemaître held that faith and reason were independent, but never in conflict.

More recently, the first Ph.D. in computer science was awarded in 1965 to a Catholic nun, **Sr. Mary Keller**, who wrote her doctoral thesis on automatic differentiation (AD) and inductive inference, both topics of essential importance that continue to occupy researchers in programming language and statistics today. AD would later prove instrumental in the development and popularization of deep learning.

In this paper, we survey Catholic contributions and perspectives towards the subject of computation. We argue for a Catholic approach to AI, which is grounded in the values of universal accessibility, rooted in faith and reason and informed by the latest developments in computer science.

2 Gnostics

Despite its centuries-long history, computer science is still a nascent discipline, and there are many things we do not know about the origin of life, the nature of consciousness, and the limits of computation. The Catholic church has a long history of engaging with these questions from its beginning, and has produced a number of philosophical and theological treatises on the subject.

Early Gnostic gospels describe the creation of the world as a kind of simulation, and the human soul as a kind of divine spark which has been imprisoned in a fallen material world, and through obtaining Gnosis one is able to escape from it and return to the divine realm. These teachings were condemned as heretical by the early Church, but have been influential in the broader culture, featuring prominently in the popular science fiction series, *The Matrix*, which posits a simulated reality inhabited by stranded human souls who must learn secret knowledge to defeat sinister agents and free themselves from it. Far from being a fringe belief, these ideas are deeply ingrained in the hacker culture and embedded in the popular imagination.

These views are echoed by Cartesian dualism, simulationism and the modern transhumanist movement, which seeks to transcend the limitations of the human body and mind through the use of technology. In contrast, the Catholic church teaches that the human body is a gift from God, and we should not seek to escape from it, but rather seek to obtain a more wholesome union between the body and soul.

Like the Gnostics, modern CS has a reputation of being somewhat esoteric, and many of its practitioners fashion themselves after a kind of secular clergy, featuring cults of personality and benevolent dictators for life (BDFLs). The purpose of CS is not to create a new religion for the cognoscenti, but to help people learn, communicate and coordinate. Technology must be used to unify, and not to obtain secret knowledge for oneself and the privileged few. We should be cautious of the dangers of technocracy, and the occult ideologies that often accompany it.

3 Apologetics

The Catholic Church has a long history of engaging with the sciences, and has produced a number of apologetics defending the unity of faith and reason. It has long held that faith and reason are not in conflict, but are complementary and reciprocal ways of understanding God's creation. The Church teaches us the human mind is a gift from God, and that it is our duty to use it to the best of our ability.

Statistical techniques appeal to faith when they are used to make predictions about the future. If a statistical model is faithful to the data, we can have faith in its predictions. But as Thomas Aquinas argues, faith is not blind, it is based on reason. We can reason about the consequences of statistical models, and use them to make better decisions. Formally

modeling statistical techniques in a logical framework allows us to rigorously study their faithfulness. This is what probabilistic programming is all about.

4 Opportunities for dialogue

We will now discuss some opportunities for dialogue between the Catholic Church and the field of computer science. We will focus on three areas: the limits of computation, the relation between the mind and body, and the distinction between normative and descriptive statements.

4.1 TCS and the limits of computation

Under the banner of rational transhumanism, technological cults have emerged pushing the view of digital superintelligence and panpsychism. This is not only incompatible with a rationalist understanding, but anathematic to the Catholic faith.

As Pope Francis argues, limits are “frequently overlooked in our current technocratic and efficiency-oriented mentality” and yet “decisive for personal and social development”. This parallels the theory of computation, which studies the boundaries of what can and cannot be computed and how much power it takes to do. TCS offers a principled way to reason about the limits of unbridled computationalism, and computer science should ignore these limits at their own peril.

As argued by Roger Penrose, the ability of the mind to see truth cannot be computed on a Turing machine nor reduced to blind calculation.

4.2 Ensouled bodies and embodied agents

Properly viewed, thinking machines are not a threat to human dignity, but an opportunity to better understand the nature of intelligence and its relation to the soul. The development of thinking machines can be seen as a kind of extension of the mind, just as the body is an extension of the soul. Like a mechanical calculator, we can use it to understand and better appreciate the structure of the universe.

4.3 Modal logic and reachable worlds

The entanglement between “is” and “ought”, normative and descriptive statements is a central theme in the philosophy of mathematics. What is true by fiat is not necessarily true by necessity. Computation is a constructive kind of mathematics, and shares many similarities with Catholic outreach to the poor and marginalized. We do not impose our beliefs on others, but offer a moral way to understand the world and our place within it.

Modal logic is an interesting move here. Type theory says, “here is the way things are”. This is the ivory tower. Modal logic says, “here is the way things could or should be”. This allows us to encode the distinction between normative and descriptive statements, and to reason about the consequences

of certain actions. It is the language of possibility, and offers a way to encode intent and possibility in a formal language.