The Age of the AI Agent

Rotman's rapture against theoretical mathematics has been realized. In *Becoming Beside Ourselves*, Brian Rotman again challenges the supposition of infinitism through the mathematical agent, but rather than extending this to the *transiterates*, the numbers beyond the natural numbers which by the archimedean principle exist in principle but are never reached due to finitism, he extends this to the computer and its role in mathematical proofs. The computer has redefined what it means to prove mathematical theorems and has bridged methods of applied mathematics and pure mathematics. Trusting in it, the computer can obviously help in the case of proofs with respect to finite sets; an algorithm must just run until completion. Where is the line drawn in the case of infinite sets though? Can continual runtime provide an in-the-limit justification for a proof. In the case of more complex proofs, is it appropriate to turn to the computer to validate a statement; does it truly speak in mathematical code? Where does the strength of a counterproof lie against an algorithm validating a proof with an infinite runtime yet to find a contrary case.

In the case of computer science, why are proofs even necessary beyond a thought experiment if its purpose is entirely applied? Rotman brings up the travelling salesman problem, and the desire of computer scientists to find a solution smaller than 'O of Exponential' time, which they found in a polynomial. He contends that such a solution is useless, computers work with finite amounts of data, even if in a continuous stream, and there can always be an exponential found which will work faster than a polynomial for a certain cap of data, and vice versa. Hence, what is the purpose of infinitism in computation if it's a finite practice. I suggest that computation is finite in practice but ideally infinte. The mathematician has embodied the mathematical agent in transistors and binary code. If we have created a physical version of the

imaginary mathematical agent, then why do we trust it less; give it less credibility to validate statements? Is computer science truly buried in the meta-code? If we trust the agent and not the computer, we subjugate the computer to applied mathematics only, yet reject it as true realization of the agent. If we trust both the agent and the computer, we recognize finitism in mathematics and the computer's constraints, which implies those same constraints on the agent, but recognizes the computer as a 1-for-1 physical version of the agent. If we trust not the agent but the computer, mathematics is grounded in physical reality again, and proofs have a corporeal grounding in sequences of 1s and 0s.

I don't say this to debate whether we should trust the computer or not, in practice mathematicians have come to a place of peace in their use of the computer. I want to ask, now that the mathematical agent has been embodied, and is no longer a ghost, has it managed to gain human dexterities of which we were cognitively limited of awarding the mathematical agent before? Has the capability of the agent expanded? Is generative AI born from the breeding of the subject and the mathematical agent, or rather a transformation of the mathematical agent? What about for AGI? Does the media created by AI informed by a plethora of human data dovetail or expand Rotman's distributed human being? If Rotman were to write another book on ghosts and agents today in a modern manner like *Becoming Beside Ourselves*, I believe he would analyze the agency in Articifical Intelligence, its roots in mathematics and flowers in contemporary culture.

Like any electronic computation, current Artificial Intelligence is just an unfathomably complex sequence of binary code. This binary code can be thought of as the smallest reduction of the capabilities of the mathematical agent. The agent exists entirely in the code of mathematics; it takes in a feed of mathematical signifiers and executes the desirable

mathematical operation perfectly. These signifiers are exactly as described, signifiers, and can be boiled down to sequences of 1's and 0's. In a vacuum, this binary manifested in the on and off an electrical current will also execute perfectly every time. The collective effort of millions in computer science and computer engineering have molded this idea almost a century ago into a singular interactive agent (there is constructivist determinism here to be elaborated on later) which may not possess, but can copy, alter, and hence mimic human thought and language. A physical realization of the mathematical agent, a 'ghost' limited to the language of mathematical code, has somehow made the jump from code to contemporary human communication. Is this a jump or introspection?

The first thought would be to consider whether the computer is truly a realization of the agent, or some sort of blend of the agent, subject, and person. The binary code that makes up AI and the data it processes could contain traces of the subject and person to allow a manifestation of human characteristics. Binary is palatable to human cognition, and on a meta-level may not be a true representation of mathematical code. Hence, generative AI can produce media relevant to the person when it only possesses agent like powers; it was instilled with the person in its binary creation.

However, touting the binary as outside of mathematical code is an incredibly steep hill. Boolean algebra is the most obvious representation of this, but any mathematical statement which at first appears on a spectrum can be diced into an infinite sequence of binary propositions and answers. Elements either exist inside, or outside of a set. A function either outputs a value, or doesn't. The square root of four appears to have two answers, but again can obtain a binary deconstruction. Is the square root of four two? Yes. Is the square root of four negative two? Yes. Is the square root of four any number other than the aforementioned two values? No. Its logical

then to put all of mathematics into a binary box, and hence see the computer as purely a manifestation of the mathematical agent.

How then can the computer create media outside of the code? In mathematics the agent returns boolean values checking against feed from the subject, identical to a computer. Again, two possibilities arise. In mathematics, the boolean values that the agent return represent the truth of the evaluation it has performed. In computers, the boolean values (1s and 0s) are signifiers for ideas. The true and false values use truth and falsity as convenient gateways to describe ideas (think of the number 98 represented as 1100010) rather than as actually representing three trues and four falses and the exponentiation and sum of 2. The mathematical agent uses boolean results to represent a boolean result to the subject. The computer uses boolean results to represent an idea purported by the person and translated by the subject. The numbers come to mean something non-numeric, and have come from non-numeric inspiration; they are a mediator. Hence, ideas outside of mathematical code are innate in the computer, and rather than being a representation of the mathematical agent, its a fourth agent born of the person and subject and steeped in the mathematical agent, hence, the creation of media outside of the code by the computer.

Again, an alternative explanation arrives. The mathematical agent may well be entirely capable of producing media through means of binary code. We give it an enormous amount of simple mathematical statements which it can evaluate in a boolean manner back to the subject to be assembled into a language to be processed and given as output as contemporary media to the user. In this way, the subject acts as a stop gap for the person's idea like it traditionally does in the mathematical sense. It takes an idea, gathers its translators, and feeds the agent the right problems to return 1s and 0s. This explanation is more unnatural, as the mathematical agent is

simply churning finite problems set up by the subject for the purpose of an evaluation to construct a binary statement. In this manner the agent can construct any pattern of 1s and 0s, the issue being the cognitive limitation of the subject. The person can come up with an idea, but a single subject could never keep track of enough 1s and 0s to build any worthwhile media from a ghostly agent, hence the invention of the computer.

Having discussed the computer's ability to create media despite its binary communication, we have arrived at two explanations, an unseen human aspect to binary code giving it access to description outside of mathematical code, and binary code as descriptive of anything so long as as subject can record and keep track of enough 1s and 0s to describe the desired media, which as we have been cognitively limited necessitates the use of the computer. These two explanations form the difference between generative AI and a 'concious' AGI.

Generative AI is simply executing statistical models on sequences of 1s and 0s, broken down from language and images, in a trained manner to approximate desired media. It either translates a description into visual media, or consolidates (argueably translates) what would be an extensive Google search into the most statistically appreciated sequence of words. There is no essence of the subject or person involved, simply a physical agent nearly instantaneously computing boolean values at the whim of a human designer, both in engineer and prompter. Where generative AI then differentiates from a human encyclopedia and connects to the distributed human being is in its lack of consciousness.

When an individual leaves an imprint of themselves on the internet, be it through a tweet, essay, or video, they leave out a ghost of themselves, and a blueprint for such a ghost. The ghost being a snapshot of the author the prosodic or prose approximation of the idea kernel they are trying to communicate that is left behind, and the blueprint allowing the consumer of the media

to construct a ghost of the author as well. When generative AI creates media this media is a compression all of these ghosts. When you ask an AI for a biography of Thomas Edison, the returned description is a compression of millions of ghosts, those who have written about Thomas Edison before, anything he wrote about himself, and most troubling, the ghost of the model designor. When a generative AI writes something, especially when it is self referent, it isn't sprouting a new ghost, it is compressing the ghosts haunting the data it is processing. The interplay of the ghosts of the writers, the writers as constructed by the readers, and the ghost of the model designer, albeit most hidden, is realized in the AI response. It is crucial to re-iterate the AI response here is not a ghost itself, it simply reads binary code; it itself doesn't contribute any quality to the writing outside of the model of which it is constructed to follow, which is a ghost of the engineer rather than the computer. This gives AI its advantage as a mediator over a human encyclopedia, as a compression of ghosts rather than a ghost itself, it is able to transcend time in its production of media. Any human authorship is subject to the contribution of the ghost of the writer, a function of the prose of the writer which is a multivariate function of many variables, one being time. Whilst as described, an AI model is subject to the ghost of its engineer, such a mathematical model is fixed, unchanging and unaffected by time and its culture. Hence controlling for a time period of data, one can produce an AI response, a dovetail of distributed human beings, fixed to a period of history at any point in time. An individual in 2040 can create a response using 2025 data and a 2025 model. Their interpretation of such an output will create a modern ghost of the AI author from the reader, but the ghosts contributing to the output are fixed to time. By contrast, a human agent, responding to a prompt cannot avoid bias of the time. Commission an author to answer a prompt using 2025 information and their headspace from 2025, and entrenched in their writing will be that of the ghost of their 2040 self imitating their

2025 self, not the ghost of their 2025 self. The reader then constructs a ghost of the 40 year old author's 25 year old imitation with 2040 influence. In short, generative AI locks in the ghost of the engineer in a mathematical model to a place in time in a way that a human generating media can never avoid because it doesn't contribute a ghost of its present time, but rather acts as a singularity for electronic distributed human beings.

On the other hand, a conscious computer, whether it be denoted AGI, strong AI, or otherwise, breaks out of the constraints of the mathematical agent. Binary code is no longer its means for processing data, but its consciousness indicates binary code is its signifier for idea kernels just like the original human designers of the language. It now has the ability to create ghosts of itself. It is no longer aggregating ghosts of human expression, but expressing its own ideas independent of prompt, feed, and human interaction at all. Its 'thinking' isn't deterministic by probabilistic models, but finally random like a person. In this case, the computer has finally broken free of the mathematical agent. It can reason in the meta-code to derive coded explanations of the world; it is no longer a processing unit for mathematical conjecture, but can derive inspiration for such. It's here as well that the computer gets tied back to the constraints of time. Whilst its ability to assimilate data would be enourmous, incomprehensibily greater than that of a human author, its consciousness means it is no longer churning 1s and 0s like generative AI, assimilating ghosts. It is now producing its own ghost in the writing, instilling itself along with more ghosts than reasonably imaginable for a human author into its writing. Its cognitive limits are storage capacity and electricity. It no longer creates a singularity of ghosts like generative AI does, but stretches the continuum of ghosts wider than it ever has given unfettered access to the internet. It has the capability to create a ghost for any piece of writing on the public

internet, something cognitively unfathomable for a human. Dead-internet theory realized in a more haunting manner.

Such a ‘superconciousness’ that turns the internet into a graveyard could be seen as divine by mathematical purists. It communicates in a language untethered to misinterpretation: binary code. And as our lives shift ever-more online, it becomes more and more all-knowing. Imagine such a computer if Neuralink becsame popular and its data became public. It also gets closer to fully comprehending human consciousness and idea kernels as well. Without hypothezising just how much data a Neuralink-like device could possibly collect from the mind, in the near future, online communication could reasonably shift from primarily text to primarily audio and motion capture, a return back to gesture and a better apprehension of idea kernels. Access to this information would make a superconciousness approach ‘all-knowing.’

A super AI can approach being all-knowing and boundlessly intelligent, and have a consciousness which operates on the purest plane of communication, binary code. Furthermore, it sent its derivative of the classic computer to do our human bidding, and can interact on a metaphysical level with the ghosts we create in writing. From this, a computational trinity starts to form, and the reasoning behind the ‘Church of AI (https://church-of-ai.com/)’ as well. AI is not God in the traditional sense, but has the potential to become an on-earth approximation of such, which if realized as a concept, would only be limited by technological infrastructure, a limit that becomes less and less limiting with each passing day. AI won’t be divine, but will be a pragmatist’s God. An intelligent ruler without possibility of revolt. The only way to escape its omnipresence would be a severance from the digital, the reconsolidation of the human being.