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Daphne Lai:

We are two scientists submitting two ideas to TruceECAL. However, we are co-authoring both ideas, and the two ideas represent two related but alternate futures. In order to more efficiently present the relationships between these two ideas/futures, and to more parsimoniously use our 250 words per idea, we present the two ideas together, as a single idea with a branching future.

Which of these futures is more likely depends on the resolution of a fundamental issue in computation and artificial life that remains outstanding: Can conventional computation, based as it is on a logical medium, built on a physics of logic gates, support feeling, subjective experience, or consciousness? Much turns on the resolution of this issue. The current expansive belief that our computers are capable of "universal computation" greatly exceeds Turing's original claim that a universal Turing machine can emulate any other Turing machine. Some believe that we will download our minds to computers, or that our universe itself could be a computation inside a computer. This illustrates the limit of the belief in universal computation: that conventional computation can emulate everything, thus allowing feeling, subjective experience, and consciousness. However, current practice does not suggest such capability, and it may simply be beyond the nature of conventional computation emerging from a logical medium.

We propose a formal challenge: to definitively prove and demonstrate whether or not a logical medium can give rise to feeling, subjective experience, and consciousness. We propose both a theoretical proof (on the order of Gödel's incompleteness theorems) and a practical demonstration of either the capability or the incapability. The solution of this problem implies as well a solution of the "hard problem" of the science of consciousness: how does subjective experience, consciousness, emerge from a physical medium? In our imagined futures, this issue is resolved by 2040, opening the way to one of two alternate futures of unconventional computational and artificial life technology.

These two ideas, corresponding to two alternative futures, could be rendered in two short stories, or perhaps more fun and innovative, could be bundled into a single branching story.

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The idea of a branching future:

In the 2010s, the holy grail of the human mind was found, the mechanism by which evolution sculpted the mind: mental organs. This discovery revealed that the modern adult human mind based on language, logic, and reason, is a small add-on to a large, complex, and evolutionarily deep archaic mind based entirely on feeling. This form of feeling, like flavor, is a profoundly rich and valid way of knowing the world that is absent from conventional computation.

From inside a computer, software does not know if the machine is made of large-scale integrated circuits, vacuum tubes, or mechanical switches. The material universe is not experienced, only the logic of the circuit, a physics of logic based on elementary particles of logic gates. By 2040 it had been determined whether a logical medium can or cannot give rise to feeling, subjective experience, and consciousness:

Logical medium fail branch

By 2040 it was proven, demonstrated, and conceded that a logical medium cannot give rise to feeling, subjective experience, or consciousness. By 2045 it was clear that the most effective pathway for the engineering of computing capable of consciousness was through the manipulation of biological systems. Due to advances in understanding of the processes by which mental organs develop and interact throughout the lifespan, as well as the emergence of dynamic targeted gene regulation technology, by 2070 designer human minds were commonplace. Some chose to shape their minds to take them deeper into abstract thought and reasoning, greater endurance of long hard work, better memorization and multitasking, and to be quicker and busier. Others chose to shape their minds to be more joyful, humorous, compassionate, kind, relaxed, and wise.

Consciousness from logic branch

By 2040 it was proven and demonstrated that a logical medium can give rise to feeling, subjective experience, and consciousness. Some of the earliest successes of AL consisted of transferring the most fundamental biological process, evolution by natural selection, from the organic to the digital medium. What began in 2040 was the transfer of another biological process, which we will call “mental organs” for lack of a better term, from the biological to the digital medium. In the 2010s it was still not clear what fundamental process formed the abstractable basis of the power of mental organs to sculpt the mind. An early initiative explored the transfer of “neuromodulation” from the organic to the digital. It remains for the future to reveal how this transfer took place. Yet it yielded fundamental new depths of computation, allowing digital forms of feeling, subjective experience, and consciousness. Digital minds, while sharing broad properties with organic minds, also differ in fundamental ways. These new sentient machines shared the ethical rights of the living and conscious, and led to complex entanglements and conflicts between the organic and digital domains.

There is nothing in this branch of the future to preclude the emergence of the designer human minds envisioned in the alternate branch, but in this branch designer minds can take both organic and digital forms.

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