

## **Podcast Episode 6: mind uploading**

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### Teaser

Hey everyone! Welcome to the new episode of the Life Extension Podcast – technology & magic, society & business. Have you ever asked yourself, if one day it will be possible to upload your mind to a computer or an avatar? Then you might benefit from this episode. I will talk about the motivation of mind-uploading, the promoters of this idea, and the philosophical so-called “mind-body problem”. I will shortly touch on technical approaches of possible mind-uploading, as well as the merging of the neuroscience field with computer science. Importantly, we will also look at personal identity, and what mind uploading might do to it. Last, there will be a few thoughts about the religious aspects underlying this modern science narrative. Continue listening to this short episode, if you want to gain a firmer footing in thinking and discussing about mind-uploading.

### What: Introduction

In this episode I want to introduce and evaluate mind-uploading, as perhaps the most radical and utopian idea of the life-extension industry. Research on brain, consciousness, brain simulation, and interfaces with information technologies is in full swing. For example, the European Commission is funding this sort of research through the Human Brain Project on a massive scale. Purpose of mainstream research at the moment is to speed up developments in A.I. and brain medicine.

Mind uploading, on the other hand, goes way beyond what mainstream science is aspiring to. Promoters conceive mind as a “platform independent code” (Randal Koene), to be uploaded from the platform of flesh to another substrate. This would include transferring the mind of a real person incl consciousness and without loss of personal identity.

Mind uploading technologies would depend on the same basic research as mainstream science, but their approach is different. Mainstream science takes one step at a time, while transhumanist thinkers start with the utopian end-game of the human species as a spiritual vision and work backwards from there to identify relevant technological options. Obviously, the chances of realization of projects like mind uploading are extremely speculative at the present point in time. Next to massive philosophical debates about the theoretical possibility, we can't be sure that the required technologies will ever be developed. But a few people, organisations, and businesses are trying just that. For example, Nectome, a new start-up, is developing brain preservation technologies, which allow brain scanning at neuron level. The hope of the company is that in the future preserved brains could be scanned and digitalized to allow in a best-case scenario the re-awakening of a deceased person, or at a minimum to extract long-term memories from a dead brain (Regalado 2018; Nectome). A little more established is the approach of cryonics. A few cryonics companies worldwide offer to freeze your body, or alternatively just your head, expecting that future technologies will be able to transfer your mind, suspended in time, from flesh to an artificial medium and bring you back to life in the process.

### Why: motivation of mind-uploading

To understand the motivations of promoters of mind uploading, one needs to take a perspective of truly universal scale. This is not just about the individual benefit of immortality. It is much larger than that. We are talking about man overcoming the limits of human biology, becoming super-human or god-like, and extending humanity into the universe through inter-stellar space travel. Although these ideas are entirely speculative, they reflect the excitement and uncertainty about how science and technology is going to shape individual and social life in the future.

### Who: Promoters

There are a number of transhumanist activists and organisations engaged in exploring and promoting ideas on the potential of mind uploading from philosophical (Sandberg and Bostrom 2008; Wiley 2014) and technological perspectives.

An important transhumanist platform of research into mind uploading technologies is carboncopies.org by Randal Koene. Another platform is 2045.com by Dmitry Itzkov, which promotes the development of avatars (note 1).

The way how individuals think about thinking shapes their subjective experiences. For example, it could appear more natural to an IT engineer to see his own feelings as an algorithm, or to imagine the possibility of mind uploading, compared to a social scientist. Due to separate ways of thinking, the social scientist might be convinced that his consciousness is informed by historical experience, culture, and social relations, while the IT engineer might conceive mind as something a computer does. As a result it does not come as a surprise, that promoters of mind uploading are more likely to have an IT background, rather than a social science background.

### Philosophical check: mind-body problem

Bodily experience shapes mind and mind shapes experience. Body and mind are intimately related, and it is not clear if they could be separated by even the most sophisticated technology. Since antiquity philosophers are debating if mind and body are independent from each other, or if mind is a function of brain (note 2). This is termed the mind-body problem. In the case that they exist independently from each other, mind could perhaps be transferred as an independent object, similarly to spiritual ideas of soul or ghost. In case that mind is rooted in the material properties of the brain, and possibly the brain's environment, mind transferring would of course need to include the brain and its environment in digitalized form. A daunting task, which in essence would require nothing less than the artificial simulation of the entire world of the transferred mind. Transferring mind to an avatar might then not be

enough – the entire world would need to be transferred, like in the movie “The Matrix” (Wachovsky 1999).

### Personal identity

Where mind uploading, transferring, or copying is the most difficult to be imagined is personal identity. As personal identity is experienced by each of us in a subjective way, each of us also can have an opinion on this. Can personal identity be maintained with the exact memories, emotions, and psychological traits? Can it survive outside of its original body? Would the copy identify with the original? Could the copy really be considered a continuation of the original? What is the motivation of the original to have his mind transferred, if actually his original self would still die within his biological body?

Many would assume that their subjective consciousness is intimately related to their bodies. They might also imagine mind as emergent property of body and its inter-related environment. A virtual uploading to a computer as an independent entity separate from body and environment would not be possible in this case. Even a sophisticated avatar or robot would not be able to replace the original body. A new body in a new environment could create a new mind with different subjective experiences, even a different personal identity. After all, the entire attraction of immortality consists in the idea, that our consciousness and feeling of personal identity would not die. But the prospect of waking up with a changed consciousness and personal identity after uploading would be as attractive as the idea to be reborn as your annoying neighbor or someone even less interesting to you.

Even in the imagination of James Cameron’s movie “Avatar” human minds were only projected to their avatars through a radio signal, while their brains remained physically in their biological bodies. Ultimate transfer of Jake’s mind, the main character of the movie, to his avatar only happened through a spiritual process, or you could say by magic.

### Neuroscience merges with computer science

Mind-uploading is the copying or moving of an individual’s conscious mind from its biological medium to an artificial medium without loss in function. That receiving medium could be robotic, virtual, or biologically synthesized. Such a purely digital concept of mind uploading only makes sense if one assumes a human brain to be a computer and a person to be nothing else than a collection of information. This is exactly what the field of neuroscience seems to assume as it is increasingly merging with computer science. Once such a concept of the human condition is accepted, there are further preconditions to make mind uploading a possibility. Among them would be that machines will be able to think like humans. Thinkers like Marvin Minsky have predicted this decades ago (Minsky 1988) – and nowadays the field of A.I. is actually working towards that goal. Furthermore, sufficient computational power would need to be available to handle the enormous complexity of brains. Ray Kurzweil, a leading transhumanist thinker and now working for Google has predicted this more than 20 years ago (Kurzweil 2001).

### How: Technical approaches

Several technological steps would be necessary to upload a mind. First, neural simulation would need to make enormous advances, up to the point to simulate an entire human brain. Second, a method must be developed to retrieve the information from the brain. That could be by dissecting, scanning, or nanomachines working at the level of each individual neuron. Third, the retrieved information would need to be transferred to an artificial medium. Technological developments of all three steps are already being attempted at very small scale. However, they are not nearly advanced enough to substantiate claims that mind uploading might be possible ever from a technological point of view.

### Religious narrative

Last but not least in this short evaluation of the idea of mind-uploading we should not overlook, that mind uploading does not only originate in science fiction and information technology. But it strongly resonates with all kinds of spiritual traditions, even when thought up by so-called atheists. This is the old religious narrative of resurrection, told from the worldview of modern science.

### Conclusion

The idea of mind uploading is central to transhumanist thinking. But this is not just a fantasy of achieving individual immortality. Even transhumanists are well aware that the technology of mind uploading is not around the corner. Mind uploading, digital immortality and ultimately overcoming and improving the human species through science and technology are among the most speculative and utopian ideas within the life-extension industry, and may well echo old religious narratives and apocalyptic scenarios. But, dear listener of this episode, even if you are not a transhumanist believer or a science fiction fan, it's worthwhile to try get your mind around these ideas. None of the future technologies which are promoted by transhumanist activists and businesses are impossible according to the known physical laws. Exponential advancement in science and technology is a reality in which we live. At the same time, we still know very little about the universe and the strange origin of biological life forms. Our technological capabilities, as well as our corresponding worldviews will change, same as they have done again and again in the short human history. But perhaps it doesn't really matter if mind uploading will be possible in the future, or not. At the very least, thinking about it could be a highly interesting exercise, helping to reflect on the world and ourselves.

### Notes

*(Note 1): 2045.com not only promotes to develop avatars replacing the biological body, but also in later steps to transfer consciousness from human individuals to avatars, and ultimately the creation of a new species with capabilities far beyond humans.*

*(Note 2 ): The idea of mind and body as independent objects is called dualism and is represented among others by Plato and Descartes. The other of mind as a function of brain and consciousness therefore being rooted in material is called materialist monism Transhumanism and computational neuroscience mix cognitive science (mind as*

*software, brain as hardware), neuroscience, with strong A.I. (an artificial mind which can pass the Turing test; different from weak A.I. which only tries to simulate human mental states in a machine.*

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