

THEME 03

I am an integrated information system, therefore I am

A.I.

BRAIN-COMPUTER

Concepts like general artificial intelligence, brain-computer interfaces, brain uploading, the internet hive-mind and full-immersive virtual reality have been the bread and butter of science fiction. However, against the backdrop of recent developments in digital technology, these concepts are being taken more seriously. Consequently, age-old discussions about the nature of consciousness are now refuelled. Interestingly, this coincides with a new trend of that considers consciousness to be a fundamental part of our universe and one worthy of academic inquiry.

Our observations

- [A new study](#) published in the journal *Nature Communications*, reports that scientists from the Neuroimaging Unit Optical Neuroimaging Unit at the Okinawa Institute of Science and Technology Graduate University have developed an imaging technique that allows for the mapping of electrical activity in single neurons in animals that are wide awake. This has been impossible due to now, due to the delicate structure of neurons and the fast changes in their voltages.
- Philosopher David Chalmers notes in a few interviews (e.g. [Quartz](#), [New Scientist](#)) that panpsychism is being taken more seriously by the academic community as it elegantly takes up some of the problems in the debate around consciousness.
- In the [article](#) “Are we already living in virtual reality?” in *The New Yorker* Joshua Rothman writes about a fourteen-partner E.U.-funded project called *Virtual Embodiment and Robotic Re-Embodiment* that investigates how virtual reality can be used to manipulate the mental model of the participant’s own body.
- Experiments like the [China-brain](#) and [the Chinese room](#) aim to investigate the nature of consciousness and respectively to what extent it can be reproduced on a different substrate and can be grouped in greater structures.
- Lately, quite a few movies have explored technologically mediated consciousness (e.g. *Ex Machina*, *Her*, *Avengers: Age of Ultron*, *Ready Player One*, *Automata*, *Blade Runner 2049*, *Ghost in the Shell*, *Transcendence*, *Upgrade*, *Chappie* and *Prometheus*). One explanation for this trend is that against the backdrop of today’s smart technology (e.g. Alexa, self-driving cars, image recognition), people are more open to and interested in the idea of artificial intelligence and thinking about its real-world implications.



Connecting the dots

The current developmental phase of digital technology can be characterized by its proximity to and complex interaction with the mind and subjective experience. This is exemplified either by directly augmenting/manipulating the mind through interface technologies like virtual/augmented reality and brain computer interfaces or by artificially recreating the mind, as [some](#) aim to do in the domain of AI. These developments confront us with what Andy Clark likes to call the “Skin Bag Bias”, i.e. “that whatever matters about mind, must depend solely on what goes on inside the biological skin-bag, inside the ancient fortress of skin and skull.” He goes on saying, “[as] our worlds become smarter, and get to know us better and better, it becomes harder and harder to say where the world stops and the person begins.” Our daily lives will increasingly show us that experience and/or correlates of experience can take place in technologically mediated situations, so the locus of technology as an extension of our body will be suddenly shifted to technology as an extension of our mind.

Underlying this shift in perception, is a deeper question about the nature of consciousness. Unfortunately, the term ‘consciousness’ is plagued by semantics due to its loose and ambiguous use, complicating most of the discussions regarding this topic. Conveniently, philosopher David Chalmers addresses this confusion by categorizing two types of problems concerning the understanding of consciousness, namely the easy and hard problems of consciousness. The easy problem refers to functional and behavioral aspects of the mind (e.g. sleep vs wake, information processing, self-consciousness, attention), which still have a basis in empirical research (e.g. neuronal correlates, human behavior). In contrast, the hard problem focuses on the existence of subjective experience itself, and how it relates to our preliminary

materialist understanding of the brain and world in general. Discussions regarding the hard problem are certainly not new and have led to all kinds of ontological positions, ranging from substance dualism (i.e. mental and body as fundamental separate substances) to monist positions like physicalism/materialism/functionalism (there is only the physical), idealism (there is only the mental) and neutral monism (there is only a neutral substance, neither physical nor mental).

Interestingly, the idealist and neutral monist position, which can be found in the philosophical work of Russell, Spinoza and Wittgenstein, have [gained](#) more credibility in the debate lately in the form of panpsychism, in which consciousness is seen as fundamental and universal. Its attractiveness primarily lies in the circumvention of the issue of strong emergence, by not letting a new quality like consciousness magically emerge from complex configurations of matter, but instead by making it intrinsic to its substrate. Compatible with this position is the [Integrated Information Theory \(ITT\)](#), which postulates that consciousness is highly correlated with information processing. Physicist Max Tegmark translates ITT to four principles in which the degree of consciousness is dependent on how much storage, processing, isolation and integration of information is taking place in a system. With the expectation that we are moving towards human-technology hybrids, this view offers a much more malleable and continuous way to consider consciousness can manifest itself (from elementary particles to computers). However, despite its growing popularity, panpsychism is not without its own philosophical caveats, as represented by the combination problem, which asks the question, “how can lower-level conscious entities form higher-level conscious entities?”.

Implications

- If panpsychism becomes a more accepted world view, ethics concerning AI will be taken [more seriously](#). Furthermore, regardless of if AI is accompanied by sentience, general AI will demand ethical codes (also known as roboethics) as it already influences ethical human behavior.
- As panpsychism is already more accepted in Eastern philosophies (e.g. Neo-confucianism, Japanese Buddhism, Advaita Vedanta), the normalization of such a world view could mean that there is an increasing cultural and spiritual compatibility with the east.
- More panpsychist views could open us up more to the hybrid between technology mediated spirituality (e.g. meditation/mindfulness [apps](#) and [peripherals](#))