Transhumanism: A Dangerous Two-Way Street

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What is the next evolutionary step for humanity? One possibility is the merging of man and machine. But is humanity ready for transhumanism, and how should we prepare for it? ***Christian Keszthelyi*** *finds out!*

Imagine being able to view and send emails without using your laptop or being able to browse the web without your phone. Tech devices that are controlled using brain signals are in development, blurring the line between humans and cyborgs and bringing us closer to a transhumanist future. But what are the risks of such technologies? Can they be hacked, phished, or compromised like our current devices?

THINK talks to artificial intelligence Prof. Alexiei Dingli (Faculty of Information and Communication Technology, University of Malta [UM]), Prof. Ing. Kenneth P. Camilleri, and senior lecturer Dr Tracey Camilleri (both from Faculty of Engineering, UM) to understand how humans grapple with attaching machinery to flesh and bone.

HISTORY OF TRANSHUMANISM

'*Lasciate ogne speranza, voi ch'intrate*', frequently translated as 'Abandon all hope, ye who enter here,' is the famous line from Italian writer Dante Alighieri's *Divine Comedy*. The text is inscribed on the gates of Hell as Dante passes through them. In this 14th-century epic poem, Dante coins the word 'transhumanism' to capture his realisation of divine life in paradise. Research today still tries to outline what transhumanism may have meant for Dante. For Heather Webb from the University of Cambridge, the poet may have meant it as the state when an individual, after death, fully integrates into a 'co-presence with other individuals in a network of relations based on mutual recognition and interpersonal attention.'

Prof. Alexiei Dingli
Photo by James Moffett

Some two centuries later, French philosopher René Descartes published *Discourse on Method* (1637) which is still viewed today as one of the early precursors to transhumanist ideas, in which the Frenchman envisions a new type of medicine that would allow humans physical immortality and stronger minds. His pondering hits home with an eerie accuracy in the modern world.

Today, the word's meaning has changed, and some intriguing progress in transhumanism has been made. Elon Musk's Neuralink, a brain-computer interface business, has recently released a video that claims to portray a monkey named Pager playing the video game *Pong* with their thoughts. Pager's brain signals were sent wirelessly to a computer through an implanted device. Pager learned to play *Pong* with a joystick first by being rewarded with a fruit smoothie.

Our brains might soon be able to communicate with computers, and computers might be able to communicate directly with us. The underlying technology is being researched and developed. At the University of Tübingen, neuroscientists invented a method to alter the human brain's activity during transcranial magnetic stimulation (TMS), by simply 'holding a wire coil over the head, resulting in movement of the arms or legs'.

But back to Pager, once their *Pong* mastery reached acceptable levels, the joystick was disconnected. Pager controlled *Pong* with mind signals alone. Neuralink's aim is to bring the technology to a stage where people with neurological conditions would be able to communicate with devices remotely, gaining virtual mobility.

BRAINAPP

The UM is running similar projects with humans. BrainApp exploits non-invasive Brain-Computer Interface (BCI) technology to use brain signals to control motorised beds, opening up accessibility to individuals suffering from motor disabilities.

'We use one particular phenomenon related to BCI, which is based on the flickering of visual stimuli. By attending to a visual stimulus, a brain signal uniquely related to each visual stimulus is evoked, which is recorded and then identified through signal processing algorithms (a powerful set of computer instructions that are able to learn, reason, and react). Each stimulus, and the corresponding brain signal, is associated with a control function; in our case, to the movement of a motorised bed,' Dr Tracey Camilleri tells THINK.

'Although we are reading signals from the brain, we are not reading thoughts,' Prof. Ing. Kenneth Camilleri clarifies. BrainApp uses the evoked brain signals in the context of brain-computer interfaces, which means that the recorded brain signals are interpreted according to a previously-agreed token. Therefore, each recorded brain signal triggers specific instructions programmed into the computer, such as moving a bed up or down.

In the case of operating more intricate machinery, such as a bionic hand for example, the process is different, Prof. Ing. Camilleri says. 'If I were to move my hand, I have to think about moving it. An EEG (electroencephalogram) cap, for example, will record brain activity as this happens. What is interesting is that when I actually move my hand and when I just *think* about moving my hand, similar brain signals are produced in the brain. It means that by merely thinking about hand movements, a bionic hand could be made to start moving,' he explains.

I, ROBOT

Research suggests that humanity is close to sci-fiesque machine-to-human enhancement. 'I think we are not very far away from such advancement. Today we are already creating smart prosthetic devices for limb replacement,' Prof. Alexiei Dingli tells THINK.

To transfer will from the human mind to inanimate technology, brain signals need to be captured, interpreted, and communicated to a device. While this can be done by physical brain implants, the use of non-invasive technologies is on the rise, creating cautious optimism. A simple headband is able to capture and transfer brain signals to control devices. Today, to a limited extent, the technology is already working.

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Research has recently been enthusiastic about TMS as a technology that does not require any implants. 'In TMS, a magnetic field is applied to certain locations in the brain to, for instance, suppress certain brain activities. As this is done through magnetic fields, TMS does not require any implants. I do think that in some years, it would be possible to specifically write into the brain. This is a point where there could be huge ethical issues,' Prof. Ing. Camilleri says.

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If two-way communication becomes ubiquitous and humans carry devices that are able to facilitate such an exchange, service providers and legislators must ensure that software uses unbeatable encryption. No user should ever have to fear being unconsciously manipulated by third parties; the technological and judicial safety nets must be in place before the rollout of such technology. That is the only way such advancements should be introduced to mass usage.

'This is something that really worries me. What happens if we can implant false memories, ideas, or ideologies? But, let us explore a brighter area of consideration: education. What if we could implant knowledge in people's minds? Instead of children having to go to school, they would upload (or download) data in their brains, leaving them with precious time to run other errands or play. The most precious skill is not possessing the information but processing it. Information is already available thanks to technology and the online world,' Dingli says.

The premise Dingli raises is a genuinely interesting one. If humans had the possibility to download lexical and theoretical knowledge, a lot of time could be spared. That time would be available for learning creative or critical thinking skills and putting theory into practice. It would result in an exponential growth in professional expertise. Furthermore, fine-tuning or updating that knowledge would also happen in an instant (think about the ever-changing legislative environment, for instance) which would result in fewer professional mistakes.

THE ROAD AHEAD

As technology advances, controlling devices external to the human body will become more integrated and simpler to use. As soon as the technology becomes available to consumers, legislators will need to quickly adapt the legal environment to control previously impossible events. But how fast can the legislative environment respond to technological changes?

'From experience, technology moves forward, and legislators try to catch up at a later stage. Think about where we are at with social media. Nobody would have ever thought that social media could have had such an impact on such a varied spectrum of our lives. I think technologies that involve brain signal communication can be dangerous if left unchecked,' Dingli adds.

While science fiction movies and cyberpunk communities are often dystopian (and sensationally focus on the harmful aspects of human-machine marriage), technology has great potential to support our species. As tech advances, humans must be mindful of the penned legislation to prevent ethical conundrums and be prepared to guard the sanctity of their minds.

Further Reading

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