

Education, population, poverty, tax...getting views on topics like those in Jersey isn't the difficult part – but have you ever noticed how many people sound eminently credible when talking about them, even though they may actually be basing their views on conjecture, false facts and blind guesswork?

There is a real danger in making the 'facts' fit the opinion, rather than the other way around – which is exactly the point at which someone with an eye on the latest buzzwords will smugly insert the phrase 'post-truth' into the conversation, imagining its actually helpful.

So, we've asked the Jersey Policy Forum to add some robust material to those crucial local debates – the point is not to provoke agreement or acquiescence; it is to provide reliable material on which others can build their views.



Gailina Liew, Director, Jersey Policy Forum



AI + NI = ?

So, you've heard a lot about AI (artificial intelligence) from me but what about 'NI'? If you're thinking about UK politics, it might mean Northern Ireland or, you might be texting and use it as an abbreviation for "no idea" and both could be right depending on your context. For this article, I'll use NI to refer to neural interfaces. Why might it be important to be aware of NI and understand what they are?

On September 10, 2019, the UK Royal Society published a 106 page report entitled 'iHuman – Blurring lines between mind and machine.' It sounds like a hefty report but is, in fact, very readable with terrific diagrams and provides a good summary of what NI is, what the implications might be for people, and raises questions to ponder about how they might be used to benefit and harm us.

The full report can be found at this link: <https://royalsociety.org/-/media/policy/projects/ihuman/report-neural-interfaces.pdf>.

So, what are they?

Neural interfaces, broadly defined, are devices that interact with the nervous system of an individual. More specifically, the term is frequently used to describe electronic devices that are placed on the outside or inside of the brain or other components of the central and peripheral nervous system, such as nerves and links between nerves and muscles, to record or stimulate activity – or both. Interfaces placed inside the brain or body are known as internal, invasive or implanted technologies, as opposed to external, noninvasive or wearable devices.

Hundreds of thousands of people have benefited from the medical applications of these technologies already but there is growing concern about how these technologies might be used to cause harm as well. We are learning that the security of IoT (internet of things – using digital networks to link to physical objects like your kettle, fridge, etc.) is vulnerable to hacking and loss of privacy, so the concern

about 'brain-hacking' and questions about what is ultimately controlling human action and thought with these emerging technologies are important for public policy considerations. If your implanted pacemaker or wearable to track your mood has an IP address, you would be vulnerable to a hacker (or a corporation, insurance company, government, etc.). Lots of questions and issues now come to mind, right?

The questions and issues get even more complicated when you think about combining AI and NI.

A well-known figure in this space is Elon Musk who has been busy with his company, Neuralink, to develop a system to implant very thin neural threads into a brain that would then record and transmit signals to allow the brain to interact directly with machines. These neural threads (each only 6 microns in diameter so thinner than a human hair) are covered in sensors and would be inserted by a robot and

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INVASIVE TECHNOLOGIES

○ Recording technologies ● Stimulating technologies



Cortical implant



Neural dust



Neural lace



Neuropixels



Stentrodes



Optogenetics



ECoG electrocorticography



DBS Deep brain stimulation



VNS Vagus nerve stimulation



Cochlear implants



Retinal implants



Vestibular implants

NON-INVASIVE TECHNOLOGIES

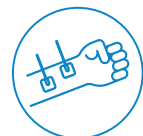
○ Recording technologies
● Stimulating technologies
○● Recording and stimulating technologies



EEG Electroencephalography



MEG Magnetoencephalography



MMG Mechanomyography



FES Functional electrical stimulation



TENS Transcutaneous electrical nerve stimulation



TMS Transcranial magnetic stimulation



fMRI Functional magnetic resonance imaging



fNIRS Functional near-infrared spectroscopy



tDCS Transcranial direct current stimulation



EEG with FES

eventually allow paralyzed people to be able to control and use computers and phones with their brains. This work was made public for the first time earlier this year and Musk says that he hopes to have the system working in a human brain by the end of next year.

According to Dr. Mathis, a leading neuroscientist at Harvard's Rowland Institute, competition for talent is fierce; Apple, Facebook, Google and Twitter have all offered jobs to her students before they complete their PhDs.

Fifteen years ago, roughly 2,000 undergraduate degrees and less than 400 PhDs in neuroscience were awarded in the United States. Those numbers are now at roughly 5,000 and 600, and the demand for people who are fascinated by the complexities of the brain who can also wrap their minds around vast amounts of data and understand the moral and ethical implications of their work is exploding as companies with much bigger budgets than

academic institutions race to dominate our collective mindshare.

The Royal Society expects that neural interface technologies will continue to raise profound ethical, political, social and commercial questions that should be addressed as soon as possible to create mechanisms to approve, regulate or control the technologies as they develop, as well as managing the impact they may have on society.

What is the call to action for Jersey in this area? What priority on the Jersey public policy agenda should this area be accorded? It might be important to exercise your individual preferences now while you're still in control!