

to prevent these from being manipulated by new technologies," the conservative Pinera said.

The Chilean bill contains four main fields of legislation: guarding the [human mind](#)'s data, or neuro-data; fixing limits to the neuro-technology of reading and especially writing in brains; setting an equitable distribution and access to these technologies; and putting limits on neuro-algorithms.

Spanish scientist Rafael Yuste, an expert on the subject from Columbia University in New York, told AFP some of these technologies already exist, and even the most remote will be available within 10 years.

'A new Renaissance'

They are already being applied to animals in laboratories.

Scientists have experimented with rats, implanting images of unfamiliar objects in their brains and observing how they accept those objects in real life as their own and incorporate them into their natural behavior.

"If you can enter there (into the chemical processes of the brain) and stimulate or inhibit them, you can change people's decisions. This is something we've already done with animals," said Yuste.

The science has opened the possibility of designing hybrid humans with artificially enhanced cognitive abilities.

The risk is that, without proper safeguards, the technology might be used to alter people's thoughts, employing algorithms via the internet to re-program their hard wiring, to dictate their interests, preferences or patterns of consumption.

"To avoid a two-speed situation with some enhanced humans and others who aren't, we believe these neuro-technologies need to be regulated along principles of universal justice, recognizing the spirit of the Universal Declaration of Human Rights," said Yuste.

Yuste considers neuro-technology a "tsunami" that humanity will have to deal with, which is why people need to be prepared.

"Neuro-technology can be scary if you think about dystopian science-fiction scenarios. However, for every dystopian scenario, there are 10 beneficial ones," said Yuste, who sees neuro-technology as "a new Renaissance for humanity."

Already, neuro-technologies are used on patients suffering from Parkinson's or depression by stimulating the brain with electrodes to "alleviate the symptoms," said Yuste.

Similarly, deaf people are treated with "cochlear implants in the auditory nerve" that stimulate the [brain](#).

It is hoped that something similar in the future will restore sight to the blind or treat those with Alzheimer's by strengthening the memory's neuronal circuits.

"It will be a beneficial change for the human race," said Yuste.

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