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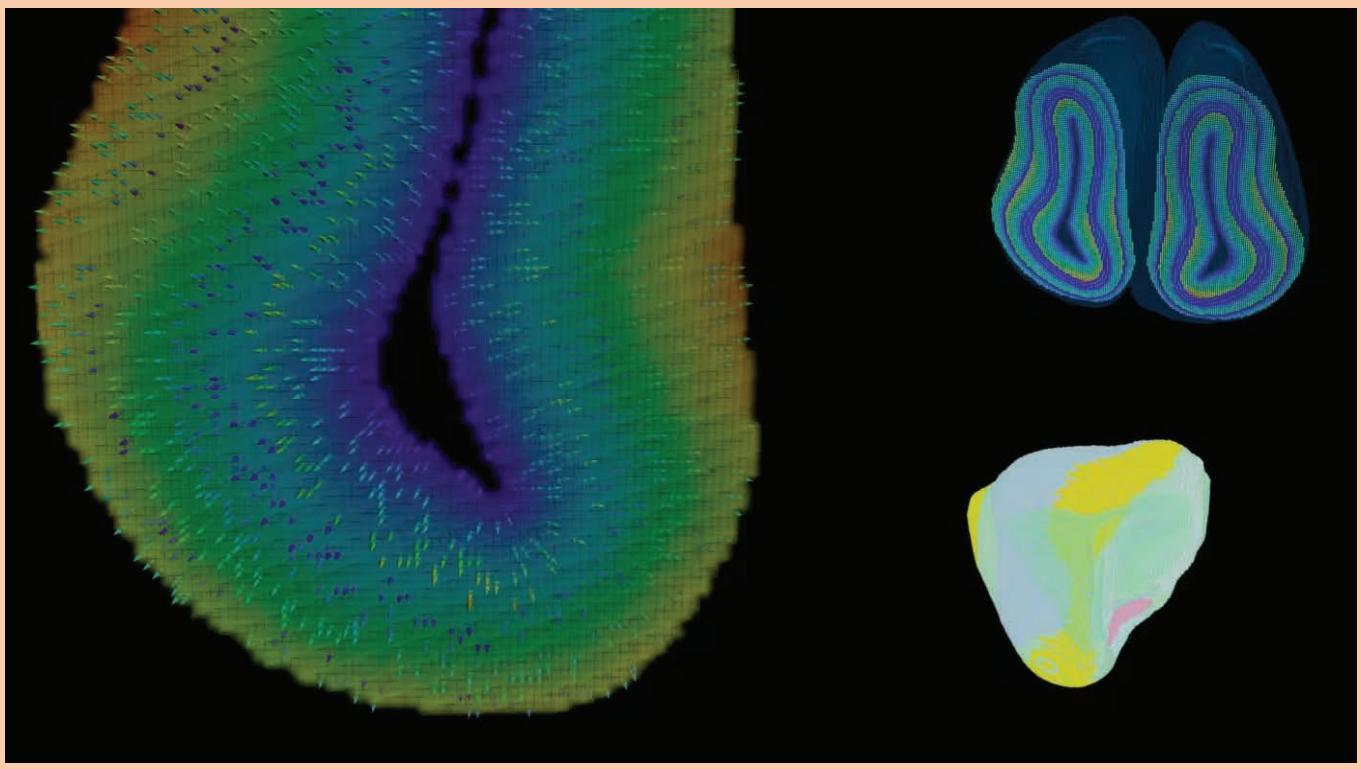
Microsoft Corp

Microsoft teams up with AI start-up to simulate brain reasoning

New artificial intelligence learns from real-world experience rather than pre-existing data

MICHAEL PEEL — LONDON



Researchers are strongly interested in the potential of using inspiration from the human brain to improve AI © inait

Microsoft has joined forces with a Swiss start-up to deploy a new artificial intelligence model that simulates mammal brains' reasoning powers to advance fields from financial trading to robotics.

The partnership between the US tech giant and Lausanne-based inait exploits two decades of digital neuroscience research to mirror biological intelligence and improve AI's capabilities.

A digital reconstruction of the hippocampus with 800,000 neurons © inait

The technology's backers argue that it is transformative because it can learn from real-world experiences instead of relying on spotting correlations in pre-existing data.

Richard Frey, chief executive of inait, said the group was founded in 2018 "with the idea that the only proven form of intelligence is in the brain and if we could master the brain, then we could do a very different, very powerful, novel kind of AI".

He added: "I am excited that we are now building products where we teach digital brains of various sizes and types to address the biggest challenges major industries face today."

The companies, which unveiled the collaboration on Tuesday, will use inait's technology to expand Microsoft's AI model offering to its customers.

In the financial sector, the partnership will focus on delivering advanced trading algorithms, risk management tools and personalised advice. In robotics, it will help develop machines for industrial manufacturing that are more adaptable to complex and dynamic environments.

"inait is pioneering a new AI paradigm — moving beyond traditional data-based models to digital brains capable of true cognition," said Adir Ron, Microsoft's Emea cloud and AI director for start-ups and digital natives.

The announcement highlights intense interest among researchers and companies in neuroscience and the potential of using inspiration from the human brain to improve AI.

inait's work builds on a 20-year Swiss government-funded initiative completed in December to use brain research to create biologically accurate digital replicas of the organs.

Henry Markram, the Swiss project's leader and inait's co-founder, said the project harvested data from research on mammal brains to develop 18mn lines of computer code for generating simulations.

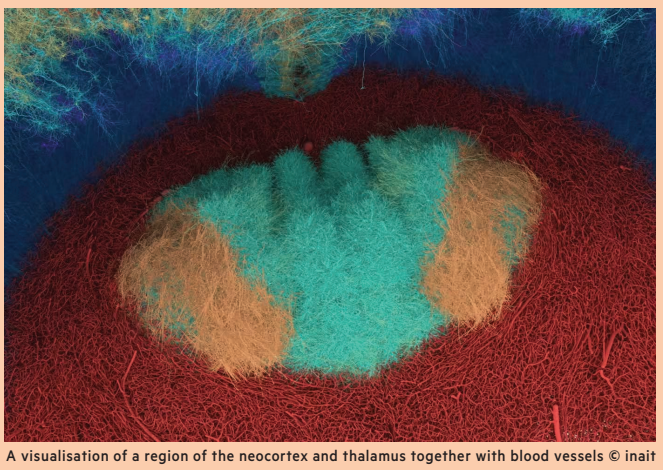
"It was mostly built around the mouse brain but it is a generic recipe and it can be used to recreate or replicate the brains of other species as well, all the way from ants to — in principle — humans," he said.

AI models based on brain simulations had the potential to be less energy-hungry and learn much faster than existing deep reinforcement models and to continue to do so once rolled out to a customer, Markram added.

The approach faces several hurdles, such as the complexity and resource-intensiveness of constructing a replica of the human brain. However, Markram argued that many business products would not need this.

The simulation technology developed during the Swiss project is being made available to researchers through a mix of free and subscription products from the Open Brain Institute, a non-profit founded by Markram.

That could be a gateway to bespoke simulations to allow scientists to investigate and better understand neurological conditions such as autism, he said.



A visualisation of a region of the neocortex and thalamus together with blood vessels © inait

Researchers hope to build on knowledge gained from projects such as the map of an adult fruit fly brain unveiled last year. Such mapping initiatives are aimed at establishing an atlas of "connectomes" — a set of pathways for information to flow between the neuron cells that make up the brain and the synapses linking them.

But while connectomes were static, the dynamic qualities of simulations could be vital to comprehending how brain processes work, said Anton Arkhipov, an investigator at the Allen Institute, a US-based non-profit bioscience research organisation.

"Perhaps a reasonable analogy is that the connectome is a map of city roads, whereas simulations offer you realistic scenarios of traffic moving through the city under various conditions," he said.