Google announced the largest high-resolution map ever available of brain activity

Extremely confusing, but still very impressive.

Scientists from Google and the Janelia Research Campus in Virgina have just published a high-resolution map of the largest-sized brain activity of any kind, including there's a 3D model showing 20 million synapses connecting about 25,000 neurons in a fly's brain.

This model is a memorable milestone in connectomics, which uses detailed rendering techniques to map the physical path of the brain. This map is also called a "connectome", covering nearly a third of the fruit fly's brain. To this day, only one organism - a C. elegans - has been mapped to the brain in this way.

The articulation industry has received mixed reviews in the scientific world. Advocates argue that the industry helps link physical parts of the brain with specific behaviors, which are crucial goals in neuroscience. But the critics say that connected learning has yet to make any major breakthroughs, and they say that mapping these extremely difficult neurons is a waste of resources that should have been for other things.

" *Restructuring is clearly a technological marvel," said* Mark Humphries, a brain researcher at Nottingham University. But he added that it was primarily a resource for other scientists to use. "It won't answer all the scientific questions it needs to answer itself; but it could help solve some interesting mysteries."

Brain map of fruit flies

The 3D map created by Google and the FlyEM team in Janelia is undoubtedly a technological achievement, the product of a combination of automated methods and hard work of people.

The first step in creating the map was to cut the parts of the fruit fly's brain into pieces about 20 microns thick, which is roughly one-third the width of a human hair. Fruit flies are a popular subject in connectomics, because they have a relatively simple brain but show complex behaviors, like jumping to attract a mate.

The brain pieces are then processed by submerging them with threads of electrons from a scanning electron microscope. The data collected consists of 50 trillion 3D pixels, or voxels, which have been processed using an algorithm that retrieves the path of each cell.

Although Google possesses extremely strong algorithmic power, it still has to rely heavily on people to check the operation of the software. The company says scientists at Janelia have spent two years and hundreds of thousands of hours checking 3D maps, validating the path of each of the 20 million chemical synapses through real headsets. Virtual reality and customizable 3D editing software.

However, after going through the process, the map only covered part of the fruit fly's brain - also known as the hemibrain. In total, a fruit fly's brain contains 100,000 neurons, while the human brain has nearly 86 billion. Listening to it is enough to understand that it is still a very long time before we can create a complete connectome showing our own nerve path.

Joshua Vogelstein, a biomedical engineer and co-founder of the Open Connectome Project, said the results would bring many benefits to scientists. Vogelsteain said that in the next decade, data provided by projects like this will eventually yield satisfactory results.

" *I believe that people are impatient about what connectome will bring. The amount of time from when a good technology starts being conceived, and when real scientific activities using that technology will often take. about 15 years. It's now 15 years later, and we can start doing science "*- Vogelstein said.

Google and the FlyEM team have posted their collected data online for everyone to see and download here. The group also published a printed document describing their research methodology, and said they would publish more documents about their work in the next few weeks.

Reference: TheVerge