1. The brain is composed of specialised cells that enable it to process information by the use of electrical impulses
2. As the figure shows, these cells, neurons, have specialised into many many types. They serve different functions, include different proteins and markers, and can be classified in many different ways.

1. The most recent estimate puts the number of neurons in the human brain at 86B.

1. Each neuron connects with thousands of other neurons, forming a massive network.
2. So, the brain can be thought of as a massively parallel processor.

1. To take applications from the extreme ends of the spectrum: immediate clinical applications, immediate technological applications.

1. A simplified diagram. Actually a lot more complex

1. Lots of hardware and software is required for basic neuroscience research.

1. Often ignored, but not less important

1. This includes all research related activities, tools, and output, not only source code.

1. Give how interdisciplinary neuroscience is, most researchers are NOT trained in development
2. This implies, and this is based on anecdotal evidence, that the software used in research is not of the best quality

1. The other side of the bridge is the users
2. Because they aren't trained, they have a hard time setting up and using the software
3. If correctness of a tool cannot be verified, how can the correctness of the scientific result be claimed?

1. All the resources are already available in the community—all one needs to do is find others who share interests and start working!

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1. We learn when synapses change in the brain
2. As an example, let's say we have a neuron that was activated by a smell.
3. Later, we found out that that was the smell of some food, say curry.
4. Because these neurons fired one after the other here, this synapse is strengthened.
5. When this happens repeatedly, the synapse is strengthened again and again.
6. Until, the faintest whiff of the smell reminds you of the food!
7. Of course, the more you look at it, the more information you find, but that doesn't mean that we can't study or apply it.

1. This is all it takes to simulate two neurons that are connected through a synapse.
2. Of course, this is a simple example, but the point is—it's just programming with a little bit of domain knowledge.