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Values in the workplace

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Presentation outline – Neuromorphic technology

Who / What / When / Where / Why / How

Neuromorphic chips were first conceptualized in the late 1980’s by Carver Mead, an American scientist while he was working at the California Institute of Technology. Neuromorphic computer chips are ones that try to mimic the activity of a human brain. While normal chips are very linear, sending everything around to a central processor, a neuromorphic chip’s architecture is more like a human mind, with billions of silicon “neurons” all connected in parallel. A traditional chip can only handle one calculation at a time for each thread on the CPU, whereas a neuromorphic chip can handle much more than that.

One of the issues with neuromorphic technologies is that these computers can be modelled after any given actual human’s brain. You could in theory, do a 3D scan of a human brain and build a neuromorphic processor based on the mapping of neurons built from the scan. From there, you can recreate the firing synapses involved a given memory, therefore “uploading” your memories to a computer. Your hard drive would contain the sequences of synapses to fire to re-create the memory as opposed to the actual memory itself. There are a few issues involved with this, one being that you could in theory “Steal memories”. You could take a prisoner, and instead of interrogating them, you could “download” the memory or information you need. This isn’t necessarily possible, because the only way to record a memory would be by repeating the firing of the synapses in the brain, but it could be possible with the advancement of other technologies. With this technology, should you be able to upload all your memories, your mind could live beyond the lifespan of your physical body. You could have your mind running in parallel with a computer to continuously upload the sequencing of synapses firing. There are already devices that exist such as neurostimulators that are used to stimulate your brain in certain ways to help cure certain illnesses such as OCD and PTSD, so making a device to record the stimulation as opposed to creating it isn’t a far stretch. The other issue with this is that using these technologies, maybe you could download memories. If you could create a neural mapping of your brain inside a simulation and calculate which synapses to fire in your brain based on those used in another, you could download a memory into your own brain. This sounds like science-fiction stuff, but it’s technology that could be possible in the future and we’re currently working towards.

Any controversial issue in Computer Science is incredibly difficult to solve. People will move towards the technology no matter what the issues involved in it are. The only thing you can really do to prevent the technology from getting used in the wrong ways are by creating strict regulations and laws around it’s research, development and usage. The issue is that like everything else, people will continue to do it illegally, regardless of the ethics or laws involved.

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