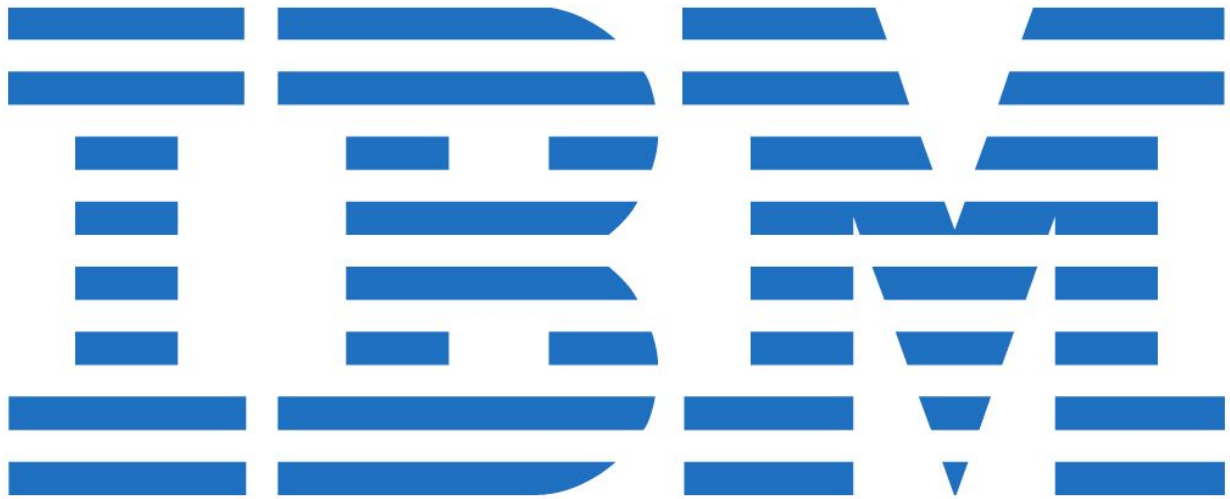
IBM going TrueNorth in system lookout for seizures

April 8 2016, by Nancy Owano



(Tech Xplore)—IBM researchers are working on a system that may prevent brain seizures. Cade Metz in *Wired* had a detailed story on Thursday about a Melbourne, Australia, team exploring how a computing can analyze brain waves to foretell an epileptic seizure.

Metz talked about an IBM researcher stationed at IBM's Australian research lab. Stefan Harrer is working with neurologists at the University of Melbourne on a system using a neural network, said Metz. "Harrer is feeding scans of brain waves into a neural network, in the hopes that it

can learn to recognize epilepsy."

What is a neural network? *Wired* defined it as "computer software that mimics the web of neurons in the human brain."

The IBM connection: Harrer and team are running this neural network on an experimental IBM chip called TrueNorth, which was built in the image of the human brain. Its architecture, said Metz, makes it rather adept at running neural networks.

Dharmendra Modha, IBM Fellow, can shed some light on what makes TrueNorth exceptional. "Unlike the prevailing von Neumann architecture—but like the brain—TrueNorth has a parallel, distributed, modular, scalable, fault-tolerant, flexible architecture that integrates computation, communication, and memory and has no clock."

This is a low power environment. Senior Associate Editor Rachel Courtland, *IEEE Spectrum*: "TrueNorth chips use traditional digital components to implement a decidedly more brain-like behavior; each 5.4-billion-transistor chip can consume as little as 70 milliwatts."

As such, IBM unleashed a computer design inspired by the brain with inputs and outputs as spikes.

Wired commented on TrueNorth's place in computing as well: "Nowadays, companies like Google, Facebook, and Microsoft typically run their neural networks across myriad machines inside massive computer data centers. They train the neural network inside the data center," said Metz. "With TrueNorth, IBM aims to make it easier to run neural networks on the laptop, tablet, or phone itself—and maybe on a wearable that talks to an implant in your head."

The research team's vision: to use the chip to build a wearable device

that, working in tandem with a brain implant, monitors for seizures around the clock and notifies patients before they happen. Harrer was quoted in *Wired*. "We want to do this on a wearable system that you put on a subject—on a patient—and have it do analysis in real-time, 24/7," he said. "That's the only way this technology will have an impact beyond cool research papers."

If the system were to detect brain wave patterns that indicated a seizure, then the device would notify the person by sending a wireless signal to a smartphone. "The device could provide enough notice to, say, pull your car to the side of the road before a seizure happens," Metz said.

Harrer's project is described in a peer-reviewed paper, which is for presentation at the ACM International Conference on Computing Frontiers next month in Como, Italy.

Citation: IBM going TrueNorth in system lookout for seizures (2016, April 8) retrieved 16 April 2024 from https://techxplore.com/news/2016-04-ibm-truenorth-lookout-seizures.html