

## **IBM Tries to Bring Brain Power to Computers**

**IBM Research wants to bring the brain's processing power to computers, making it possible for PCs to process vast amounts of...**

**Agam Shah, IDG News Service**

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IBM Research on Thursday is expected to uncover work it is doing to bring the brain's processing power to computers, in an effort to make it easier for PCs to process vast amounts of data in real time.

The researchers want to put brain-related senses like perception and interaction into hardware and software so that computers are able to process and understand the data quicker while consuming less power, said Dharmendra Modha, a researcher at IBM. The researchers are bringing the neuroscience, nanotechnology and supercomputing fields together in an effort to create the new computing platform, he said.

The goal is to create machines that are mind-like and adapt to changes, which could allow companies to find more value in their data. Right now, a majority of information's value is lost, but relevant data can allow businesses or individuals to make rapid decisions in time to have significant impact, he said.

"If we could design computers that could be in real-world environments and sense and respond in an intelligent way, it would be a tremendous step forward," Modha said.

There is a problem in the core philosophy of computing and a new approach is needed, Modha said. Today's model first defines objectives to solve problems, after which algorithms are built to achieve those objectives.

"The brain is the opposite. It starts with an existing algorithm and then problems [are] second. It is a computing platform that can address a wide variety of problems," Modha said.

For example, the new approach could help efficiently manage the world's water supplies through real-time analysis of data that could help discover new patterns, Modha said. A network of sensors could monitor temperature, pressure, wave height and ocean tide across the oceans. "Imagine streaming this data to a global brain that discovers invariant patterns and associations that no algorithms of today can do," Modha said.

It will also be able to sense the world's markets, like stocks, bonds and real estate, extracting patterns and associations in the way the brain extracts information from those environments.

The research is not about concrete applications yet, but about understanding what the brain does and its implementation in computing, Modha said. The research includes work on nanotechnology, which has made it feasible to realize the brain function in cognitive computing chips that rival the low-power and small space of the brain, Modha said. Neuroscience has also matured, and supercomputing technology has progressed enough for IBM to undertake large-scale simulations to test a wide variety of hypotheses.

It's a long and arduous research project that may lead to a number of technological breakthroughs, Modha said. He didn't provide a timeline for implementation of the platform.

If the company succeeds in making this platform, it will lead to an entirely new computer architecture and programming paradigm that could overwrite the traditional ways of computing, Modha said.

For the research IBM is working with the Defense Advanced Research Project Agency and universities including Stanford, University of Wisconsin in Madison, Cornell, Columbia University Medical Center and University of California at Merced.

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