



# HOW NEUROMORPHIC COMPUTING ADVANCES ROBOTICS

## VIDEO TRANSCRIPT

Elishai Ezra Tsur [00:00:12] Neuromorphic computing will build computers and designing algorithms which follow the architecture of the brain. Instead of using central processing units and registers for memory, we are using electronic neurons, which are sending spikes to each other to communicate and to do computation in the same way biological neurons communicate. Neurorobotics is considered by many to be the clear application of neuromorphic computing. We can design a very complicated algorithm that will be executed very efficiently in a robot in terms of performance and energy consumption, and it would allow us to build very advanced robotic systems that operate very efficiently and most importantly, learn as they move. Just like we are learning our physical environment by monitoring the effect it has on us while we are moving, a robot will be able to do the same using a neuromorphic robotic system while doing in-memory computing.

[00:01:16] Instead of working with traditional computers where you have a CPU and memory registers which are communicating to each other - which is very expensive bursts of information - we have distributed computing. In distributed computing, we have many neurons. Each one of them can do both computation and memory, and by that, relieving and relaxing this bottleneck that we have in traditional computers. This is why they are much more energy efficient than what we have today, but also much more agile so we can use them to learn on the fly and do the things that our biology is doing very, very well.

[00:02:02] In the future, when we are looking at a world where people will be working with robots collaboratively, not only on doing repetitive tasks, but doing something which is more expressive and more imaginative, we need robots to be able to adapt very, very quickly to a new environment and to new challenges and not to be hard coded from the beginning. This is where neurorobotics shine.

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