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HOW NEUROMORPHIC COMPUTING ADVANCES ROBOTICS

VIDEO TRANSCRIPT

Elishai Ezra Tsur: In neuromorphic computing, we're building 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.

Elishai Ezra Tsur: Neurorobotics is considered by many to be the key application of the neuromorphic computer. So, we can design very complicated algorithms that will be executed very efficiently on a robot in terms of performance and energy consumption. And it would allow us to build very advanced robotic systems that operated very efficiently, and most importantly, learn as they move. So just like we are learning our physical environment by monitoring the effect it has on us while we are moving, our robot will be able to do the same.

Elishai Ezra Tsur: In neuromorphic systems we are doing in-memory computing. So instead of working with traditional computers where you have a CPU and memory registers which are communicating to each other, which is very expensive pass 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. And 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.

Elishai Ezra Tsur: In the future, when we are looking at a world where people will be walking with robots collaboratively, not only on doing repetitive tasks, but doing something which is more expressive and more imaginative. And we need robots to be able to adapt very, very quickly to new environments and to challenges, and not to be hard-coded from the begin with. This is where neurorobotics shine.