Mortimer and Raymond Sackler
Institute of Advanced Studies

המכון ללימודים מתקדמים
ע"ש מורטימר ורריימונד סאקלר

TEL AVIV אוניברסיטת
UNIVERSITY תל אביב

פרופסור רלף אטיין-קמינגס
המחלקה להנדסת חשמל ומחשבים
אוניברסיטת ג'ונס הופקינס
בולטימור, מרילנד, ארה"ב

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Lecture | הרצאה

THE AGE OF NEUROMORPHIC ENGINEERING: PAST, PRESENT AND FUTURE

Abstract

Over the past few years Neuromorphic Engineering has become a very popular research topic. This popularity has been fueled by enormous interest in artificial intelligence and machine learning. Neuromorphic engineering, after all, is the field that attempts to build artificially intelligent and learning systems by first understanding the neurobiology of living nervous systems, and then implementing their forms or functions in physical systems (e.g. electronics, robotics and prosthetics). As the field blossoms, it is illuminating to review its genesis, to evaluate its current state and to prognose future directions, while taking into consideration contemporaneous developments in fields complementary to neuromorphic engineering.

In this talk I will review the origins of neuromorphic engineering, starting with the work of the founders such as Paul Mueller, Carver Mead, Eric Vittoz, Misha Mahowald, Rodney Douglas, Jan Van der Spiegel, and leading to that of their large diaspora of students distributed around the world. I will outline the "rate versus spike" debates of the early 1990s, the development of spiking transceiver arrays of analog neurons (e.g. IFAT, Neurogrid and CAVIAR) of the 2000s, and the recent proliferation of large scale digital neuron arrays (e.g. IBM True North, Intel Liohi, and SpiNNaker). Lastly, I will discuss some of the more recent version of the neuromorphic systems, particularly those including learning by utilizing memristors and other exotic synaptic units. I will also make some predictions regarding the architecture and composition of future neuromorphic systems. I predict that the integration of living and built nervous systems, and making them collaborate to embody cognition will be the next major frontier that will be breached by neuromorphic engineers.

The lecture will be held on Monday
2 May 2022, at 16:00

ההרצאה תתקיים ביום שני
2 במאי 2022, בשעה 16:00

The synchronized remote lecture will be given online using Zoom | ההרצאה תועבר בזום

Zoom Meeting lecture - click here