Cognitive Computing and Neuro-inspired Computation on New Computing Substrates for a next Generation of Neuromorphic Hardware

Initiative: Kurswechsel – Forschungsneuland zwischen den Lebenswissenschaften und Natur- oder Technikwissenschaften

Ausschreibung: Qualifizierungskonzepte

Bewilligung: 04.07.2019

Laufzeit: 3 Jahre 6 Monate

The motivation is to push towards cognitive computing on neuromorphic hardware using spike-based communication and dendritic computation, that is energy efficient, scalable, and that allows for robust, adaptive computation. The goal is to move the conceptual research of the group towards hardware, which implies a shift in focus from classical theoretical life sciences to engineering. In order to bridge the respective fields, the group specializing in the theory of brain-like computation needs to dive into the fields of CMOS-based neuromorphic hardware, new substrates for neuromorphic hardware and optical communication and computation. To this end, the team will start research collaborations with the Institute for Cross-Disciplinary Physics and Complex Systems (IFISC, Palma de Mallorca), Max Planck Institute for Microstructure Physics, Halle (NISE Department, Prof. Stuart Parkin) and Stanford University (Bioengineering, Prof. Kwabena Boahen), as well as technology-based joint work with the SME Cologne Chip Design and IBM Development in Böblingen.

Projektbeteiligte

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