

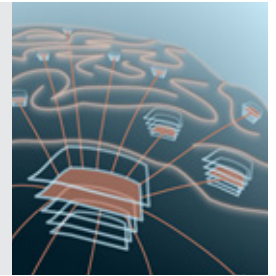
Institute of Neuroscience and Medicine (INM-6)

Computational and Systems Neuroscience

Institute for Advanced Simulation (IAS-6)

Theoretical Neuroscience

JARA Brain Institute I (JBI-1)



German Federal President Gauck visited FZ-Jülich

A glimpse of Neuromorphic Computing for Joachim Gauck

Neuromorphes Computing – vom Gehirn für die Technik der Zukunft lernen

SpiNNaker* – Beispiel einer neuromorphen Technologie von heute



entw. von Prof. Dr. Peter D. A. Davies
(c) The University of Manchester

Neuronale Aktivität im Modell von 1mm² der Großhirnrinde

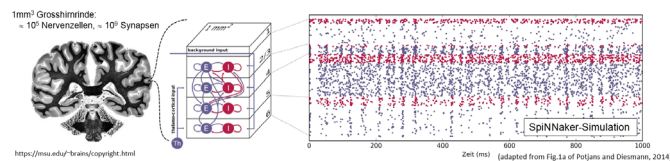


Figure 1: SpiNNaker system and simulated neuronal activity

On August 19, the German Federal President Joachim Gauck visited the Forschungszentrum Jülich. One of a very few stops of his visit was at Jülich Supercomputing Centre, JSC. The chairman of the Board of Directors of Forschungszentrum Jülich, Professor Wolfgang Marquardt, gave him a glimpse of our work on Neuromorphic Computing and the SpiNNaker system – a system developed in cooperation with our partners at University Manchester. We use the SpiNNaker system to simulate brain activity (Figure 1). Together with colleagues from Manchester, the INM-6 recently succeeded in simulating a complete model of a cubic millimeter of the cerebral cortex on the SpiNNaker system. This is the first simulation on neuromorphic hardware worldwide, in which the entire anatomical connectivity of a human brain could be simulated.

Awards

CNS2016 Student Poster Presentation Award

Maximilian Schmidt

A spiking network model explains multi-scale properties of cortical dynamics, p168, CNS 2016 Jeju, South Korea
<http://www.cnsorg.org/cns-2016-presentations>

ICCS 2016 Best Paper Award

Yegenoglu A, Quaglio P, Torre E, Grün S, Enders D. (2016)

Exploring the Usefulness of Formal Concept Analysis for Robust Detection of Spatio-Temporal Spike Patterns in Massively Parallel Spike Trains. Graph-Based Representation and Reasoning 22nd International Conference on Conceptual Structures, ICCS 2016, Annecy, France. pp 3-16.

DOI:10.1007/978-3-319-40985-6_1 ISBN: 978-3-319-40984-9

Papers

Zehl L, Jaillet F, Stoewer A, Grewe J, Sobolev A, Wachtler T,

Brochier TG, Riehle A, Denker M and Grün S (2016)

Handling Metadata in a Neurophysiology Laboratory. Front. Neuroinform. 10:26.

DOI: 10.3389/fninf.2016.00026

Torre E, Canova C, Denker M, Gerstein G, Helias M, Grün S (2016)

ASSET: Analysis of Sequences of Synchronous Events in Massively Parallel Spike Trains. PLoS Comput Biol 12(7): e1004939.

DOI:10.1371/journal.pcbi.1004939

Wippler D, Wilks RG, Pieters BE, van Albada SJ, Gerlach D,

Hüpkens J, Bär M, Rau U (2016)

Pronounced Surface Band Bending of Thin-Film Silicon Revealed by Modeling Core Levels Probed with Hard X-rays ACS Applied Materials & Interfaces. 8 (27), 17685-17693,

DOI: 10.1021/acsami.6b04666

Chua Y, Morrison A (2016)

Effects of calcium spikes in the layer 5 pyramidal neuron on coincidence detection and activity propagation Front. Comput. Neurosci. 10:76 DOI: 10.3389/fncom.2016.00076

Weidel P, Djurfeldt M, Duarte RC, Morrison A (2016)

Closed loop interactions between spiking neural network and robotic simulators based on MUSIC and ROS. Front. Neuroinform. 10:31. DOI: 10.3389/fninf.2016.00031

Yegenoglu A, Quaglio P, Torre E, Grün S, Enders D.

(2016) Exploring the Usefulness of Formal Concept Analysis for Robust Detection of Spatio-Temporal Spike Patterns in Massively Parallel Spike Trains. In: Graph-Based Representation and Reasoning 22nd International Conference on Conceptual Structures, ICCS 2016, Annecy, France. pp 3-16. DOI: 10.1007/978-3-319-40985-6_1 ISBN: 978-3-319-40984-9

Torre E, Quaglio P, Denker M, Brochier T, Riehle A, Grün S. (2016)

Synchronous spike patterns in Macaque motor cortex during an Instructed-delay reach-to-grasp task. *Journal of Neuroscience* 36(32): 8329-8340. DOI: 10.1523/JNEUROSCI.4375-15.2016.

Dahmen D, Bos H, Helias M (2016)

Correlated Fluctuations in Strongly Coupled Binary Networks Beyond Equilibrium *Physical Review X* 6, 031024. DOI: 10.1103/PhysRevX.6.031024

Accepted Papers

Hagen E, Dahmen D, Stavrinou M L, Linden H, Tetzlaff T, van Albada S, Grün S, Diesmann M, Einevoll G. T.

Hybrid scheme for modeling local field potentials from point-neuron networks
CerCor-2016-00332.R1 [Accepted]

Denker M, Grün S (2016)

Designing workflows for the reproducible Analysis of Electrophysiological Data. in: *Brain Inspired Computing*, eds Amunts K, Grandinetti L, Lippert T, Petkov N. Springer Series Lecture Notes in Computer Science [In Press]

Activities

HBP Summit 2016

12-15 October, Florence, Italy

<https://collaboration.humanbrainproject.eu/web/collab//summit-2016-about>

The Laboratorio Europeo di Spettroscopia Non Lineari (LENS) is the host of the 2016 HBP Summit. LENS leads Co-Design Project 1, Development of the Whole Mouse Brain Model and the Related Mouse Brain Atlas, and is also part of SP1 and SP2.

NEST user workshop 2016

3-4 November 2016, Karlsruhe, Germany, FZI Research Center for information technology

<http://www.nest-initiative.org/nest-activities/>



Figure 2 NEST Logo

This year, the workshop will focus on the use of spiking networks in Neurorobotics and will kindly be hosted by FZI Forschungszentrum Informatik in Karlsruhe, Germany, in collaboration with the Human Brain Project and Forschungszentrum Jülich. The workshop is supported by the Human Brain Project Education Office.

IAS-Symposium 2016

5-6 December 2016 - Forschungszentrum Jülich, Auditorium of the Central Library, Germany

<https://www.fz-juelich.de/SharedDocs/Termine/IAS/EN/2016/ias-symposium-2016.html>

The first IAS symposium is open for all members of the Institute of Advanced Simulation (IAS). In particular, we strongly encourage students and young scientists to participate in this event.

Code Generation from Model Description Languages II

7.12.2016 - 9.12.2016 Jülich Supercomputing Centre, Geb. 16.4, Germany

<https://indico-jsc.fz-juelich.de/event/25/>

The main goal of the workshop is to provide an overview of available techniques and languages to specify neuron models on different levels of detail. The languages presented include NeuroML, NineML, NESTML, PyNN and Brian. Furthermore, the workshop introduces how executable code for a specific target platform can be generated for these descriptive approaches.

1st HBP Student Conference - Transdisciplinary Research Linking Neuroscience, Brain Medicine and Computer Science

8-10 February 2017, Vienna, Austria

<https://education.humanbrainproject.eu/web/studentconference>

In the context of the 1st HBP Student Conference, young researchers from the fields of neuroscience, brain medicine and computer science receive the possibility to exchange ideas and perspectives and discuss various aspects of their particular fields of expertise relevant to the HBP.