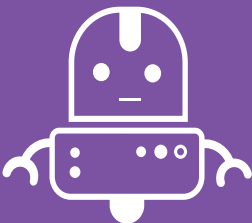Human Brain Project
Education Programme

3ʳᴰ HBP CURRICULUM WORKSHOP SERIES
SPIKING NEURAL NETWORKS:
APPLICATIONS TO COMPUTING, ALGORITHMICS, AND ROBOTICS

18 SEPTEMBER 2019
TECHNICAL UNIVERSITY OF MUNICH, GERMANY

SCIENTIFIC PROGRAMME

@HBP_Education

@hbpeducation

HBP Education

hbp_education

HBP Education Programme

WORKSHOP INFORMATION

Spiking neural networks (SNN) are a special class of artificial neural networks (ANN), in which the information is transmitted by means of pulses (or spikes) rather than by firing rates. As SNNs have shown to be excellent control systems for biological organisms, they have the potential to produce good control systems for autonomous robots. This workshop aims to bring together neuroscientists with roboticists and computational researchers developing biologically inspired learning algorithms for scientific and industrial applications. In order to enrich the discussions of SNN and its applications to computing, algorithmics and robotics, there will be an interactive session on spiking neural networks on the Neurorobotics Platform (https://neurorobotics.net/).

Scientific Chair:
Alois Knoll **|** Technical University of Munich

Organisers:
Sylvia Aßlaber **|** Medical University Innsbruck
Judith Kathrein **|** Medical University Innsbruck
Fabrice Morin **|** Technical University of Munich

Contact:
curriculum.edu@humanbrainproject.eu

Further information:
http://bit.ly/ICT_SNN2019

TUESDAY 17 SEPTEMBER 2019

13:00 - 18:00   Exams HBP Curriculum Online Courses

WEDNESDAY 18 SEPTEMBER 2019

09:00 - 09:25   Registration

09:25 - 09:30   Welcome and introduction

09:30 - 10:00   The basics of spiking neurons: Biological facts, models and computational properties
Fabrice Morin | Technical University of Munich

10:00 - 10:40   Lessons from the brain for enhancing computing and learning capabilities of spiking neural networks
Wolfgang Maass | Graz University of Technology

10:40 - 11:00   Coffee break

11:00 - 11:40   Translation of biomorphic neural principles towards closed loop SNN-based sensomotoric robot controls
Rüdiger Dillmann | Karlsruhe Institute of Technology

11:40 - 12:20   Neuromorphic hardware for real-time real-world robots
Jörg Conradt | KTH Royal Institute of Technology

12:20 - 13:30   Lunch break

13:30 - 15:30   Interactive session: Spiking neural networks on the NRP

15:30 - 16:00   Coffee & collection of feedback for the workshop

16:00 - 16:40   Open lecture - prelude to CBS2019: Bionic exo-skeletons and exo-muscles for movement rehabilitation
Robert Riener | ETH Zürich

humanbrainproject.eu/education