The Research Group NEUROINFORMATICS, Faculty of Computer Science, at the University of Vienna cordially invites you to the

Colloquium

Biologically-plausible learning

in neural networks

for movement control and cognitive tasks

with **Dr. Aditya Gilra**

(University of Sheffield, Department of Computer Science, UK)

When?	3rd of March, from 5:00 pm
Where?	Seminar room 5 (SR 5), UG, Faculty of Computer Science
	Währinger Straße 29
	A-1090 Vienna

Abstract

Recent advances in deep learning enable artificial neural networks to perform a number of specialized tasks, albeit using learning algorithms which are not biologically realistic. In neuroscience, while reasonable models of biological neurons and the plasticity of their inter-connections have been developed, it has proven difficult to deploy these in networks that learn cognitive function. I will present some of my work that tries to solve parts of this puzzle. In particular, I will introduce a biologically-plausible plasticity rule, derived from adaptive control theory, that enables stable learning of body dynamics for movement control. I will also briefly highlight work on learning simple cognitive tasks in a biologically-plausible manner. Such plasticity rules might further be useful to enable learning in energy-efficient neuromorphic devices which mimic the brain.

BIO

Dr. Aditya Gilra is a Lecturer in the Machine Learning Group at the Department of Computer Science, University of Sheffield, UK, since January 2020.

Earlier, he was a post-doctoral researcher in the groups of: Prof. Gašper Tkačik at the Institute of Science and Technology, Austria, in 2019; Prof Raoul-Martin Memmesheimer at the University of Bonn, Germany, in 2018; and Prof Wulfram Gerstner at the École Polytechnique Fédérale de Lausanne, Switzerland, in 2015-2017. He has a background in Computational Neuroscience (PhD - National Centre for Biological Sciences, Tata Institute of Fundamental Research, Bangalore, India with Prof Upinder S. Bhalla), Physics (Master's - Tata Institute of Fundamental Research, Mumbai, India) and Electrical & Electronics Engineering (Bachelor's - Indian Institute of Technology Madras, Chennai, India). See also: http://www.adityagilra.net/ .