DiSCourse Seminar

The Digital Science Center and the Department of Computer Science would like to invite you to the following presentation:

Samuele Tosatto
University of Innsbruck

Training Symbolic Machines with Reinforcement Learning

Large language models have shown remarkable progress in natural language understanding and generation but still struggle with tasks requiring complex reasoning and logic. One factor limiting their reasoning ability is the lack of Turing completeness of current models. Turing completeness is a necessary condition to allow intelligent machines to perform any computation that is theoretically possible. However, there is not yet much development for Turing-complete neural architectures. Instead, there are plenty of symbolic systems that are Turing complete, such as Turing machines, tag systems, grammars, random access memory, and so on. The downside of symbolic systems is that they are not differentiable, making them hard to train with typical machine-learning techniques. In this talk, I show how to enable gradient training using reinforcement learning on symbolic systems. The resulting algorithm allows the training of powerful Turing-complete machines with classical machine learning training based on examples, offering an alternative to neural systems.

About the speaker

Samuele Tosatto is an Assistant Professor at the Department of Computer Science and the Digital Science Center at the University of Innsbruck. His research mainly focuses on enabling robots with the ability to autonomously learn from experience. To this end, he studies and develops reinforcement and machine-learning techniques tailored to robot learning.

Date, Time, Place

Friday, 21 April 2023, 12:00 (CEST), hybrid

Participants are invited to join the event at the Digital Science Center, Innrain 15, Open Space Area (1st floor) *or* online via Big Blue Button.