



Cluster of Excellence Machine Learning: New Perspectives for Science

www.ml-in-science.uni-tuebingen.de

Cluster Colloquium "Machine Learning" Seminar Series of the Cluster of Excellence

Wednesday January 13, 2021
2:00 - 3:00 pm

The Colloq will take place virtually on Zoom
→ [Link to Colloq](#)

Generalizing from sparse data and learning from other people **Charley Wu**

Head of the Independent Research Group "[Human and Machine Cognition](#)" at our Cluster of Excellence "Machine Learning"

How do people navigate the vastness of real-world environments where the number of possibilities greatly exceeds the limits of our own experience? I propose two complementary solutions: i) generalizing previous experiences to predict novel outcomes and ii) learning from other people. The first part of my talk presents a computational model of human learning and exploration, where generalization and representations of uncertainty guide decision-makers to search effectively in vast problem spaces. Across spatial, conceptual, graph-structured, and risky domains, this model outperforms a wide range of alternatives in predicting out-of-sample search behavior, simulating human-like learning curves, and predicting human judgments. Yet we do not only learn from our own experiences, but also from that of other people. The second part of my talk lays the groundwork towards a theory of social learning, which differs in important ways from learning from the environment. Social learning requires specialized mechanisms for understanding who to learn from, how to integrate social information with individual experiences, and how to balance the social dynamics of cooperation and competition. Using VR experiments, evolutionary simulations, and data from online games, I chart a course towards a deeper understanding of the dynamics of social learning.

Taken together, my work seeks to better understand the foundations of how humans learn from interacting with the world and each other.