

Die Fakultät für Informatik an der Universität Wien lädt Sie herzlich ein zum

CS-Colloquium

Probabilistic Models and Deep Learning: A Love Marriage

mit Dr. Robert Peharz (University of Cambridge)

Wann? 8. März, 09:00
Wo? Seminarraum 9 (SR9), Fakultät für Informatik
Währinger Straße 29
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Abstract

Machine learning has arguably become a key technology of the 21st century. Thereby, the success of machine learning approaches mainly capitalises on deep learning, which addresses any given task via flexible non-linear function approximation. However, formulating engineering tasks in this way appears all too often as ad hoc. Moreover, deep learning methods are generally highly data-hungry and do not provide a principled way to express uncertainties over model parameters or predictions. Probabilistic models on the other hand, address these short-comings in an elegant way: They allow to express and maintain uncertainties in a rigorous and consistent manner, which is especially crucial in automatic decision making. Furthermore, probabilistic models naturally formulate and incorporate available domain knowledge, allowing them to be dramatically more data efficient than deep learning approaches. In comparison to deep learning, however, traditional probabilistic models suffer from various theoretical and practical difficulties. Therefore, there has been significant interest over the last few years to combine the complementary advantages of probabilistic models and deep learning, in order to get flexible and expressive models combined with the rigour of probability theory. In this talk, I will give an overview over these recent endeavours, in particular addressing deep tractable probabilistic models, variational autoencoders, deep generative models, and probabilistic programming, with a focus on my own work in these fields. As a conclusion, I will discuss open challenges and give an outlook on promising avenues for probabilistic deep learning.