CS Seminar

Modality agnostic neural data compression with Implicit Neural Representations

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2:00pm – 4:00pm

Venue:
Room 308
Chow Yei Ching Bldg
The University of Hong Kong

Abstract:

Neural Networks have recently emerged as an attractive representation of data, circumventing modality-specific representations by directly defining a mapping from coordinate to feature spaces. This has lead to a series of new approaches re-imagining the data compression problem as the quest of representing a signal in the form of a compactly represented set of neural network weights. An exciting consequence of this view is that the algorithmic design of compression techniques becomes independent of the data modality - allowing the compression of audio, images, video, 3D scenes and voxels using the exact same technique. Furthermore, due to the direct connections to topics such as architecture search, quantisation and sparsity, rapid progress is being made to match the performance of SOTA compression techniques.

In this talk, I will first introduce the basic idea of compressing data items as Neural Networks by introducing COIN (Dupont, 2021), discuss techniques that help drastically reduce computation time and space requirements through Meta-Learning and Hypernetworks (Kim & Dupont 2022) and finally show how Sparsity can be employed to further improve competitiveness (Schwarz, 2022). I will conclude with a short review of further ideas and opportunities for future work.

About the Speaker:

Jonathan Richard Schwarz is a Senior Research Scientist in Machine Learning at DeepMind and a PhD Candidate at University College London advised by Yee Whye Teh and Peter Latham. As part of his primary goal of Efficient Machine Learning he has made research contributions spanning from Continual & Meta-Learning to Transfer in Reinforcement Learning, Sparsity and recent work on neural data compression. Previously, he spent two years at the Gatsby Computational Neuroscience Unit at UCL, graduated top of his class from the University of Edinburgh and made contributions to climate change and robotics research in Japan and Germany.

All are welcome!
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