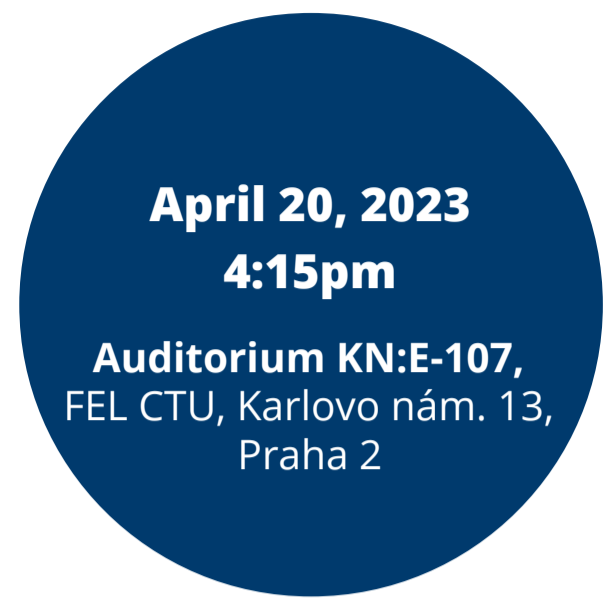


You are invited to the 54th edition of the PRAGUE COMPUTER SCIENCE SEMINAR

ROBERT A. VANDERMEULEN

Inferring and Comparing the Concept Spaces of Humans and Neural Networks



The lecture will be followed by a discussion

ABSTRACT

One fundamental goal of cognitive science is to understand how humans mentally represent concepts. One approach to this is to survey humans how they perceive objects and their similarity. The first part of this talk will cover VICE, a Bayesian method for inferring geometric representations of concepts, i.e. vector embeddings, whose geometry is consistent with similarity task responses. Representations from VICE are very effective at predicting human responses to object similarity tasks. Representation dimensions from VICE are highly interpretable, thus revealing what properties are important when humans consider object similarity. The second part of this talk will investigate how these human representations compare to neural network representations on the THINGS dataset, a collection of 1,854 object categories carefully curated for cognitive science research. Here we see what kinds of networks are best aligned to human understanding and what object properties that humans find important are also understood by neural networks.

ABOUT THE PRAGUE COMPUTER SCIENCE SEMINAR

The seminar takes place once a month on Thursdays at 4:15pm (except June to September, and December) alternately in the buildings of Faculty of Electrical Engineering, Czech Technical University in Prague, Karlovo nám. 13, Praha 2 and Faculty of Mathematics and Physics, Charles University, Malostranské nám. 25, Praha 1. Its program typically consists of a one-hour lecture followed by a discussion. The lecture is based on an (internationally) exceptional or remarkable achievement of the lecturer, presented in a way which is comprehensible and interesting to a broad computer science community. The lectures are in English.



Dr. Robert A. Vandermeulen received his PhD in Electrical Engineering from the University of Michigan in 2016. He was a postdoctoral researcher under Prof. Dr. Marius Kloft at Technical University Kaiserslautern from 2017 to 2020 and is currently a senior researcher at the Berlin Institute for the Foundations of Learning and Data (BIFOLD). Dr. Vandermeulen's work spans many topics, however his most prominent work concerns deep anomaly detection where his work on deep one-class classification was awarded the SIGKDD Workshop on Anomaly and Novelty Detection, Explanation and Accommodation Test of Time Award.

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