University of California, Irvine
Statistics Department
Seminar

Neural Probabilistic Modeling and Variational Inference

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4 p.m., 6011 Bren Hall
(Bldg. #314 on campus map)

I will give an overview of recent developments in neural probabilistic modeling, which combines (deep) neural networks with probabilistic models for unsupervised learning. These models have numerous applications in data generation and manipulation. At the same time, combining neural networks with structured priors results in flexible yet highly interpretable models for finding hidden structure in large data sets. I will first summarize my group's activities in creating and exploring new such hybrid models, such as dynamic word embeddings for studying language evolution as well as sequential variational autoencoders for video prediction and compression. In the second part, I will talk about improving variational inference as a popular training paradigm for neural probabilistic modeling, where I focus on novel variational bounds and tools for variance reduction in black box variational inference. Finally, I will show that stochastic gradient descent is a form of variational inference in its own right.

Stephan Mandt is an Assistant Professor at the University of California, Irvine. From 2016 to 2018, he led the statistical machine learning groups at Disney Research Pittsburgh and Los Angeles as Research Scientist and Senior Research Scientist, respectively. Stephan was a postdoctoral researcher with David Blei at Columbia and Princeton University. He obtained a Ph.D. in theoretical physics in 2012 from the University of Cologne, supported by the German National Merit Foundation. He serves as an area chair for the ICML and NeurIPS conferences. Stephan's interests include scalable probabilistic modeling, variational inference, Bayesian deep learning, and applications in the sciences and digital media.

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