Rob Brekelmans

CONTACT INFORMATION

13337 Beach Ave #205
Marina del Rey, CA 90292

(502) 509-9949
brekelma@usc.edu
http://github.com/brekelma

RESEARCH INTERESTS

Information theory, unsupervised learning, variational inference, representation learning (disentanglement, fairness, invariance)

EDUCATION

University of Southern California, Los Angeles, CA, USA
Information Sciences Institute / Department of Computer Science

Ph.D. Candidate, Computer Science — Aug 2016 - Present
Advisors: Greg Ver Steeg, Aram Galstyan
GPA: 3.87 / 4.0

Imperial College London, London, UK

M.Sc Computing Science (with Distinction) — Oct 2014 - Oct 2015
Thesis Advisor: Björn Schuller

University of Pennsylvania, Philadelphia, PA, USA

B.A. Mathematics — 2006 - 2010
GPA: 3.81 / 4.0, Summa Cum Laude

PUBLICATIONS

Rob Brekelmans, Daniel Moyer, Aram Galstyan, Greg Ver Steeg. "Exact Rate-Distortion in Autoencoders via Echo Noise." *Neural Information Processing Systems*, 2019.

Rob Brekelmans, Aram Galstyan, Greg Ver Steeg. "Understanding Thermodynamic Variational Inference." *NeurIPS Workshop on Information Theory in Machine Learning*, 2019.

- Accepted for 15-Minute Oral Presentation

Ayush Jaiswal, Rob Brekelmans, et al. "Discovery and Separation of Features for Invariant Representation Learning." *Under review*, 2019.

Daniel Moyer, Shuyang Gao, Rob Brekelmans, Greg Ver Steeg, Aram Galstyan. "Invariant Representations without Adversarial Training", *Neural Information Processing Systems*, 2018.

Shuyang Gao, Rob Brekelmans, Greg Ver Steeg, and Aram Galstyan. "Auto-encoding Total Correlation Explanation". *AIStats*, 2018.

Yolanda Gil, et al. "P4ML: A Phased Performance-based Pipeline Planner for Automated Machine Learning." *ICML AutoML Workshop*. 2018.

Greg Ver Steeg, Rob Brekelmans, Hrayr Harutyunyan, Aram Galstyan. "Disentangled Representations Via Synergy Minimization", *55th Annual Allerton Conference on Communication, Control, and Computing*, 2017.

Rob Brekelmans. "Analyzing the Relationship Between Neural Activity and Facial Movements in Emotional Response". *MSc Thesis*, Imperial College London, 2015.

Coursework

Advanced Topics in Statistical Machine Learning, Advanced Analysis of Algorithms, Information Theory, Convex & Combinatorial Optimization, Algebraic Combinatorics, High Dimensional Statistics & Big Data Problems, Intelligent Data & Probabilistic Inference, Logic-Based Learning

Best Project Award: "Backpropagating Importance of Training Examples"
Advanced Topics in Statistical Machine Learning Nov 2018

Deep Reinforcement Learning Bootcamp, *UC Berkeley* Aug 2017

Programming

Python, TensorFlow, Keras, MATLAB, Julia, C++, SQL

Academic Experience

Los Alamos National Laboratory, Los Alamos, NM
Applied Machine Learning Fellowship Summer 2018
- Investigated learning tree structured graphical models with latent variables
- Mentors: Marc Vuffray, Andrey Lokhov, Sidhant Misra

Information Sciences Institute, Los Angeles, CA
DARPA Data Driven Discovery Project
Graduate Research Assistant May 2017 - Present
- Automated search over machine learning pipelines for prediction tasks across diverse data settings (AutoML)
- Implement 'primitives' to be used by the planning system, including semi-supervised dimensionality reduction and graph convolutional networks

University of Southern California, Los Angeles, CA
Teaching Assistant August 2016 - May 2017
- CSCI109: Introduction to Computer Science

Additional Experience

Susquehanna International Group, Philadelphia, PA
Stock Options Trader August 2010 - March 2014
- Initiated proprietary positions, tuned trading scripts, managed distributional risk