

VADEN MASRANI

vadmas@cs.ubc.ca ~ vmasrani.github.io ~ github.com/vmasrani

EDUCATION

PhD, Machine Learning, University of British Columbia January 2018 - Current
MSc, Computer Science, University of British Columbia Sept 2015 - December 2017
BSc, Combined Physics/Computer Science, University of British Columbia Sept 2010 - May 2014

RESEARCH EXPERIENCE

PLAI Lab, Probabilistic Programming January 2018 – Current
Supervisor: Frank Wood

- **Currently pursuing my doctorate** with a focus on novel algorithms for training deep generative models
- Daily activities include reading, writing, deriving, programming, teaching, lecturing, and (when all goes well) publishing
- **Keywords:** thermodynamic variational inference, probabilistic programming, deep generative models

RIKEN, Approximate Bayesian Inference April 2017 – October 2017
Supervisor: Emtiyaz Khan

- **Variational Inference for Linear Dynamical Systems** with non-Gaussian likelihoods
- **Developed Kalman Filter Toolkit in Python** with filtering, smoothing, and parameter learning w/ EM
- **Keywords:** bayesian inference, graphical models, time series models, variational inference, optimization, autograd, tensorflow

UBC LCI Lab, Natural Language Processing January 2016 – April 2017
Supervisor: Giuseppe Carenini

- **Developed a model to predict Alzheimer's Disease from speech samples** which became my masters thesis
- **Developed system to perform extractive summarization of partial email threads** using graph-based centrality metrics and topic segmentation
- **Keywords:** natural language processing, topic modeling, summarization, medical applications, signal processing

UBC SPL Lab, Software Practices September 2014 – September 2015
Supervisor: Gail Murphy

- **Data visualization using D3 + Django** to visualize relationships between Issues in General Motors' internal database
- **Keywords:** data visualization, javascript, frontend/backend development

UBC ATLAS Experiment, Particle Physics May 2013 – September 2014
Supervisor: Colin Gay

- **Member of the Particle & Nuclear Physics** group searching for evidence of Beyond Standard Model physics (Supersymmetry)
- Trained models to detect rare particle decay using monte carlo data from the Large Hadron Collider
- **Keywords:** particle physics, big data, C++

INDUSTRY EXPERIENCE

Consultant, Vodasafe February 2020 – May 2020
Vancouver, BC

- **Helped improve AquaEye**, an underwater handheld scanner for diver search and rescue
- <https://vodasafe.ca/>

Consultant, Curbflow March 2020 – April 2020
San Francisco, CA

- **Designed custom supervised fisheye lens calibration tool** which used human labels instead of a checkerboard
- <https://www.curbflow.com/>

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Data Scientist, Think Tank Team

April 2018 – September 2018

Samsung Research America, Mountain View, CA

- Worked on technology slated to appear in the Samsung Galaxy S11
- Was granted award for "exceptional contributions" and flown to Korea to meet members of Global Think Tank Team
- <https://thinktankteam.info/>

Data Scientist, NRC Grant

June 2016 – September 2016

Code Excellence, Calgary, AB

- Participated in National Research Council project to predict SAP code performance from code/data/user features
- <https://www.codeexcellence.com/>

TEACHING EXPERIENCE

TA, DSCI 573: Feature and Model Selection

September 2020 – December 2020

TA, DSCI 512: Algorithms and Data Structures

September 2020 – December 2020

TA, DSCI 511: Programming for Data Science

September 2020 – December 2020

TA, DSCI 572: Supervised Learning II

January 2020 – April 2020

TA, DSCI 563: Unsupervised Learning

January 2020 – April 2020

TA, DSCI 575: Advanced Machine Learning

January 2020 – April 2020

TA, DSCI 513: Databases and Data Retrieval

September 2019 – December 2019

TA, DSCI 531: Data Visualization I

September 2019 – December 2019

TA, DSCI 511: Programming for Data Science

September 2019 – December 2019

TA, BAIT 509: Business Applications of Machine Learning

January 2018 – April 2018

TA, DSCI 532: Data Visualization II

January 2018 – April 2018

TA, DSCI 524: Collaborative Software Development

January 2018 – April 2018

TA, CPSC 322: Intro to Artificial Intelligence,

September 2015 – December 2015

PUBLICATIONS

Rob Brekelmans*, Vaden Masrani*, Frank Wood, Greg Ver Steeg, Aram Galstyan, "All in the Exponential Family: Bregman Duality in Thermodynamic Variational Inference" International Conference on Machine Learning (2020). <https://arxiv.org/abs/2007.00642>

Frank Wood, Andrew Warrington, Saeid Naderiparizi, Christian Weilbach, Vaden Masrani, William Harvey, Adam Scibior, Boyan Beronov, Ali Nasser, "Planning as Inference in Epidemiological Models." arXiv Preprint, 2020. <https://arxiv.org/abs/2003.13221>

Peyman Bateni, Raghav Goyal, Vaden Masrani, Frank Wood, Leonid Sigal "Improved Few-Shot Visual Classification." Conference on Computer Vision and Pattern Recognition (2020). <https://arxiv.org/pdf/1912.03432.pdf>

Vaden Masrani, Tuan Anh Le, Frank Wood "The Thermodynamic Variational Objective." Neural Information Processing Systems (2019). <https://papers.nips.cc/paper/9328-the-thermodynamic-variational-objective.pdf>

Vaden Masrani, Gabriel Murray, Thalia Shoshana Field, Giuseppe Carenini "Domain Adaptation for Detecting Mild Cognitive Impairment." Canadian Conference on Artificial Intelligence (2017). https://link.springer.com/chapter/10.1007/978-3-319-57351-9_29

Vaden Masrani, Gabriel Murray, Thalia Shoshana Field, Giuseppe Carenini. "Detecting Dementia through Retrospective Analysis of Routine Blog Posts by Bloggers with Dementia." BioNLP (2017). <http://www.aclweb.org/anthology/W17-2329>

Thalia Shoshana Field, Vaden Masrani, Gabriel Murray, Giuseppe Carenini. "Improving Diagnostic Accuracy Of Alzheimer's Disease From Speech Analysis Using Markers Of Hemispatial Neglect." Alzheimer's & Dementia: The Journal of the Alzheimer's Association 13.7 (2017) [https://www.alzheimersanddementia.com/article/S1552-5260\(17\)32851-0/abstract](https://www.alzheimersanddementia.com/article/S1552-5260(17)32851-0/abstract)

Jordan Johnson, Vaden Masrani, Giuseppe Carenini, Raymond Ng. "Generating and Evaluating Summaries for Partial Email Threads: Conversational Bayesian Surprise and Silver Standards." Proceedings of the 18th Annual SIGdial Meeting on Discourse and Dialogue. (2017). <http://aclweb.org/anthology/W17-5532>

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Marc Palyart, Gail C. Murphy, Vaden Masrani. "A Study of Social Interactions in Open Source Component Use." IEEE Transactions on Software Engineering (2017). <https://ieeexplore.ieee.org/document/8049385/>

TECHNICAL TOOLS

Python, PyTorch, TensorFlow, Pyro, MongoDB, SQL, Postgres, Bash, MATLAB, JavaScript, D3, C++, MySQL, Java, Objective-C

AWARDS AND RECOGNITION

British Columbia Graduate Scholarship	2019
NSERC Postgraduate Scholarship-Doctoral	2019 - 2021
Four Year Doctoral Fellowship	2018 - 2022
NSERC Undergrad Student Research Award	2013 - 2014
Jason Lang Scholarship	2009
Dean's Merit Admission Awards	2008
University of Calgary Admission Award	2008
Alexander Rutherford Scholarship	2008