Priyank Jaini

CONTACT INFORMATION
Google Brain, Toronto
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VISA STATUS
Post-Graduate Work Permit. Currently residing in Waterloo, Ontario.

EMPLOYMENT

Google Brain November 2021 - present
Research Scientist

Universiteit van Amsterdam October 2019 - June 2021
Post-doctoral Researcher
Hosted by Prof. Max Welling

Principal Researcher January 2021 - November 2021
Trajectory Prediction and Logic Circuit Optimization
Contract work for Huawei Technologies, Canada.

EDUCATION

University of Waterloo September 2015 - December 2019
Ph.D. in Computer Science
Advised by Prof. Pascal Poupart & Yaoliang Yu
GPA : 91.50%

Indian Institute Of Technology, Kanpur (IIT Kanpur) July 2010 - June 2015
Bachelor's and M.Sc.(Integrated) in Mathematics and Statistics
GPA : 8.4/10

PUBLICATIONS

Journal Articles

- **Accuracy Maximization Analysis for Natural Tasks and Principles of Multiplicative Noise and Filter Correlation in Neural Coding**
  Johannes Burge and *Priyank Jaini*
  Public Library of Science, Computational Biology (PLoS CompBio), 2017, [Link to paper]
- **Accuracy Maximization Analysis with Class-conditional Gaussians : Linking Normative and Descriptive Quadratic Models of Neural Response**
  Priyank Jaini and Johannes Burge
  Journal of Vision (JoV), 2017, [Link to paper]
- **Learning Directed Acyclic Graph SPNs in Sub-Quadratic Time**
  Amur Ghose, *Priyank Jaini* and Pascal Poupart
  International Journal of Approximate Reasoning (IJAR), 2020, [Link to paper]
- **A Positivstellensatz for Conditional SAGE Signomials**
  Allen Wang, *Priyank Jaini*, Pascal Poupart, and Yaoliang Yu
  under review at SIAM Algebraic Geometry, [Link to paper]

Conference & Workshop Papers (Refereed and Archived)

- **Learning Equivariant Energy Based Models with Equivariant Stein Variational Gradient Descent**
  Priyank Jaini, Lars Holdijk and, Max Welling
  Neural Information and Processing Systems, (NeurIPS) 2021
- **Self-Normalizing Flows**
  Andy Keller, Jorn Peters, *Priyank Jaini*, Emiel Hoogeboom, Patrick Forre and, Max Welling
  International Conference of Machine Learning (ICML), 2021, [Link]
  Beyond Backprop workshop, NeurIPS, 2020, **preliminary version*
- **Sampling in Combinatorial Spaces with SurVAE Flow Augmented MCMC**
  Priyank Jaini, Didrik Nielsen, and Max Welling
  International Conference of Artificial Intelligence and Statistics (AISTATS) 2021, [Link]

- **SurVAE Flows: Surjections to Bridge the Gap between VAEs and Flows**
  Didrik Nielsen, *Priyank Jaini*, Emiel Hoogeboom, Ole Winther and Max Welling
  Long Oral Neural Information and Processing Systems, (NeurIPS) 2020, [Link]
- **Argmax Flows and Multinomial Diffusion: Towards Non-Autoregressive Language Models**
  Emiel Hoogeboom, Didrik Nielsen, *Priyank Jaini*, Patrick Forre and Max Welling
  Neural Information and Processing Systems, (NeurIPS) 2021
- **Tails of Lipschitz Triangular Flows**
  Priyank Jaini, Ivan Kobyzev, Marcus Brubaker and Yaoliang Yu
  International Conference of Machine Learning (ICML), 2020, [Link]
- **Sum-of-Squares Polynomial Flows**
  Priyank Jaini, Kira Selby and Yaoliang Yu
  Long Oral, International Conference of Machine Learning (ICML), 2019 [Link]
- **Deep Homogeneous Mixture Models : Representation, Separation, and Approximation**
  Priyank Jaini, Pascal Poupart and Yaoliang Yu
  Neural Information Processing Systems (NeurIPS), 2018, [Link]
- **Online Bayesian Transfer Learning for Sequential Data Modeling**
  Priyank Jaini, Zhitang Chen, Pabla Carbajal*, Edith Law*, Laura Middleton*, Kayla Regan*, Mike Schaekermann*, James Tung* and Pascal Poupart
  5th International Conference on Learning Representations (ICLR), 2017, [Link]
  **helped with data collection*
- **Prometheus:Directly Learning Acyclic Directed Graph Structures for Sum-Product Networks**
  Priyank Jaini, Amur Ghosh and Pascal Poupart
  Probabilistic Graphical Models (PGM), 2018, [Link]
- **Depth Efficiency of Deep Mixture Models and Sum-Product Networks using Tensor Analysis**
  Priyank Jaini, Pascal Poupart, and Yaoliang Yu
  Workshop on Deep Learning Theory, International Conference of Machine Learning, (ICML) 2018
  [Link]
- **Online and Distributed Learning of Gaussian Mixture Models by Bayesian Moment Matching**
  Priyank Jaini and Pascal Poupart
  Workshop on Approximate Bayeisan Inference, Neural Information and Processing (NIPS) 2017 [Link]
- **Linking Normative Models and Methods for Neural Systems Identification**
  Priyank Jaini and Johannes Burge
  Computational and Systems Neuroscience (COSYNE), 2017 (poster presentation), [Link]
- **Online Algorithms for Sum-Product Networks with Continuous Variables**
  Priyank Jaini, Abdullah Rashwan, Han Zhao, Yue Liu, E. Banijamali, Chen Zhitang and Pascal Poupart
  8th International Conference on Probabilistic Graphical Models (2016), [Link]
- **Online Flow Size Prediction for Improved Network Routing**
  Pascal Poupart, Zhitang Chen, *Priyank Jaini*, Yanhui Geng, Li Chen, Kai Chen and Hao Jin
  IEEE ICNP Workshop on Machine Learning in Computer Networks (NetworkML 2016) [Link]

Awards

- Top Reviewer Award, ICML 2020.
- Doctoral Dissertation Award, Faculty of Math, University of Waterloo, 2020
- Huawei Graduate Scholarship in Artificial Intelligence ($10,000), 2019
- Borealis AI Graduate Fellowship ($10,000), 2019
- MITACS Accelerate Graduate Research Grant ($10,000), January 2019
- Winner ($20,000 prize money), Waterloo-Citadel Datathon 2018
- Cheriton Graduate Scholarship ($10,000 per year), University of Waterloo, 2017-2019
- Huawei Noah's Ark Lab Distinguished Collaborator Award, 2016
- Graduate Excellence Award ($5,000), University of Waterloo, 2016
- Vector Research Grants, ($ 6,000 per year), 2018-2020
- Travel Award (US $1,250), International Conference on Learning Representations, 2017
- Travel Award (US $2,500), International Conference of Machine Learning, 2018
- Travel Award (US $1,000), International Conference of Machine Learning, 2019

- Accepted at the Deep Learning and Reinforcement Learning summer school 2018, Vector Institute and CIFAR, Toronto (250 selected out of over 1200 applicants)
- Accepted at the Machine Learning Summer School 2017, Germany (110 selected out of 752 applicants)

Internships

Borealis AI, Canada January 2019 - October 2019
Research Intern
Advised by Dr.Marcus Brubaker and Dr.Yaoliang Yu
Developed theoretical results for normalizing flows with varying tail properties.

University of Pennsylvania, USA June 2015 - July 2015
Research Assistant, Neuroscience Graduate Group
Advised by Dr. Johannes Burge
Developed mathematical tools enabling characterization of task-relevant properties of natural stimuli.

University of Waterloo, Canada May 2014 - July 2014
Research Assistant, Artificial Intelligence Lab
Advised by Dr. Pascal Poupart
Developed tractable online Bayesian algorithm for parameter estimation of Gaussian Mixture Models.

Kyoto University, Japan May 2013 - July 2013
Research Assistant, Department of Systems Science and Informatics
Advised by Dr. Shin-Ichi Maeda
Developed probabilistic method for fast and robust recognition of QR codes.

Supervision

- Vasileios Charatsidis, *Unsupervised Image Classification and Hashing with Binary Representations*, Masters, University of Amsterdam

References

Dr. Max Welling
Professor
Institute of Informatics E-mail: m.welling@uva.nl
University of Amsterdam, Netherlands

Dr. Pascal Poupart
Professor Phone: +1 (519) 888-4567 x 36239
David R. Cheriton School of Computer Science E-mail: ppoupart@uwaterloo.ca
University of Waterloo, Canada

Dr. Yaoliang Yu
Assistant Professor Phone: +1 (519) 888-4567 x 34469
David R. Cheriton School of Computer Science E-mail: yaoliang.yu@uwaterloo.ca
University of Waterloo, Canada

Dr. Johannes Burge
Assistant Professor Phone: +1 (215) 573-6528
Neuroscience Graduate Group, Department of Psychology E-mail: jburge@psych.upenn.edu
University of Pennsylvania, United States of America

Dr. Marcus Brubaker
Research Director and Assistant Professor
Borealis AI and York University E-mail: mab@eecs.yorku.ca
Canada

Voluntary Work

Mentor, Inclusion and Diversity Association, University of Amsterdam January 2020 - 2021

Assistant Coordinator, Institute Counselling Service, IIT Kanpur January 2012 - May 2013

- Tackled stigma related to counseling via personal interactions with over 500 students
- Extended academic mentoring system to help sophomores resulting in 16% decline in probation
- Personally mentored 3 students out of academic probation with avg. increase in GPA by 1.8
- Pioneered a sensitization campaign on suicides for over 3,000 students on Suicide Prevention Day

- Collaborated with Govt. of India to draft guidelines to set up student support services in 32 Centrally Funded Technical Institutes

Society of People for Development, India May 2011 - July 2011

- Conducted surveys among rural people for Govt. of Uttrakhand to gauge their dependency on forests
- Used GPS to map villages across 3 districts for better monitoring and protection of forest resources

Extra Curricular Achievements

- Chief Editor, Vox Populi, Campus Newsletter, IIT Kanpur
- Coordinator, English Literary Society, IIT Kanpur
- Senator, Students' Senate, IIT Kanpur