

Priyank Jaini

CONTACT David R. Cheriton School of Computer Science
INFORMATION University of Waterloo
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RESEARCH Deep Generative Models, Mixture Models, Online Learning, Sum-Product Networks, Optimization
INTERESTS

EDUCATION **University of Waterloo** September 2015 - present
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
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), 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](#)]

Conference & Workshop Papers (Refereed and Archived)

- **Sum-of-Squares Polynomial Flows**
Priyank Jaini, Kira Selby and Yaoliang Yu
International Conference of Machine Learning (ICML), 2019 (*under review*),
- **Deep Homogeneous Mixture Models : Representation, Separation, and Approximation**
Priyank Jaini, Pascal Poupart and Yaoliang Yu
Neural Information Processing Systems (NeurIPS), 2018, [[Link](#)]
- **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 Bayesian Inference, Neural Information and Processing (NIPS) 2017
[[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*
- **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]

INTERNSHIPS **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.

AFFILIATIONS University of Waterloo, Waterloo AI Institute, and Vector Institute

- AWARDS**
- Huawei Graduate Scholarship in Artificial Intelligence, 2019
 - Borealis AI Graduate Fellowship, 2019
 - MITACS Accelerate Graduate Research Grant, January 2019
 - Accepted at the Deep Learning and Reinforcement Learning summer school 2018, Vector Institute and CIFAR, Toronto (250 selected out of over 1200 applicants)
 - 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, University of Waterloo, 2016
 - Travel Award of USD 1,250 to attend the International Conference on Learning Representation, 2017
 - Accepted at the Machine Learning Summer School 2017, Germany (110 selected out of 752 applicants)

VOLUNTARY WORK **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 Uttar Pradesh 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