Sharan Vaswani

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Academic Employment

Simon Fraser University Vancouver, Canada
Assistant Professor (Computing Science) 2022 -

University of Alberta Edmonton, Canada
Postdoctoral Researcher (Computing Science) 2020 - 2021
- Supervisor: Csaba Szepesvári

Mila, Université de Montréal Montreal, Canada
Postdoctoral Researcher (Computer Science and Operations Research) 2019-2020
- Supervisor: Simon Lacoste-Julien

Education

University of British Columbia Vancouver, Canada
Doctor of Philosophy (Computer Science) 2015 - 2018
- Supervisors: Mark Schmidt, Laks Lakshmanan
- Thesis: Structured Bandits and Applications

University of British Columbia Vancouver, Canada
Master of Science (Computer Science) 2013 - 2015
- Supervisor: Laks Lakshmanan
- Thesis: Influence Maximization in Bandit and Adaptive settings
- GPA: 4.32 / 4.33

Birla Institute of Technology and Science, Pilani Goa, India
Bachelor of Engineering (Computer Science) 2008 - 2012
- GPA: 9.37 / 10

Publications

Peer-reviewed Conference Publications

1. "Sample Complexity Bounds for Linear Constrained MDPs with a Generative Model", Xingtu Liu, Lin F. Yang, **Sharan Vaswani**. *International Conference on Algorithmic Learning Theory (ALT), 2026.* "Constrained Optimization for Machine Learning" workshop, NeurIPS 2025.

2. "Preserving Plasticity in Continual Learning with Adaptive Linearity Injection", Seyed Roozbeh Razavi Rohani, Khashayar Khajavi, Wesley Chung, Mo Chen, **Sharan Vaswani**. *Conference on Lifelong Learning Agents (CoLLAs), 2025.*

3. "Armijo Line-search Can Make (Stochastic) Gradient Descent Provably Faster", **Sharan Vaswani**, Reza Babanezhad. *International Conference on Machine Learning (ICML), 2025.*

4. "Fast Convergence of Softmax Policy Mirror Ascent", Reza Asad, Reza Babanezhad, Issam Laradji, Nicolas Le Roux, **Sharan Vaswani**. *International Conference on Artificial Intelligence and Statistics (AISTATS), 2025.*
   "Optimization for Machine Learning" workshop, NeurIPS, 2024.

5. "Small steps no more: Global convergence of stochastic gradient bandits for arbitrary learning rates", Jincheng Mei, Bo Dai, Alekh Agarwal, **Sharan Vaswani**, Anant Raj, Csaba Szepesvari, Dale Schuurmans. *Neural Information Processing Systems (NeurIPS), 2024.*

6. "Towards Principled, Practical Policy Gradient for Bandits and Tabular MDPs", Michael Lu, Matin Aghaei, Anant Raj, **Sharan Vaswani**. *Reinforcement Learning Conference (RLC), 2024.*
"Optimization for Machine Learning" workshop, NeurIPS, 2023 **(Oral Presentation)**.

7. "From Inverse Optimization to Feasibility to ERM", Saurabh Mishra, Anant Raj, **Sharan Vaswani**. *International Conference on Machine Learning (ICML), 2024.*
"Optimization for Machine Learning" workshop, NeurIPS, 2023.

8. "Decision-Aware Actor-Critic with Function Approximation and Theoretical Guarantees", **Sharan Vaswani**, Amirreza Kazemi, Reza Babanezhad, Nicolas Le Roux. *Neural Information Processing Systems (NeurIPS), 2023.*
"Duality Principles for Modern ML" workshop, ICML, 2023.

9. "Target-based Surrogates for Stochastic Optimization", Jonathan Lavington*, **Sharan Vaswani***, Reza Babanezhad, Mark Schmidt, Nicolas Le Roux. *International Conference on Machine Learning (ICML), 2023.*
"Optimization for Machine Learning" workshop, NeurIPS, 2022.

10. "Near-Optimal Sample Complexity Bounds for Constrained MDPs", **Sharan Vaswani***, Lin F. Yang*, Csaba Szepesvári. *Neural Information Processing Systems (NeurIPS), 2022.*

11. "Towards Noise-adaptive, Problem-adaptive (Accelerated) Stochastic Gradient Descent", **Sharan Vaswani**, Benjamin Dubois-Taine, Reza Babanezhad. *International Conference on Machine Learning (ICML), 2022* **(Oral Presentation)**.
"Optimization for Machine Learning" workshop, NeurIPS, 2021.

12. "Improved Policy Optimization for Online Imitation Learning", Jonathan Lavington, **Sharan Vaswani**, Mark Schmidt. *Conference on Lifelong Learning Agents (CoLLAs), 2022.*

13. "Towards Painless Policy Optimization for Constrained MDPs", Arushi Jain*, **Sharan Vaswani***, Reza Babanezhad, Doina Precup, Csaba Szepesvári, *Conference on Uncertainty in Artificial Intelligence (UAI), 2022.*

14. "A general class of surrogate functions for stable and efficient reinforcement learning", **Sharan Vaswani**, Olivier Bachem, Simone Totaro, Robert Müller, Shivam Garg, Matthieu Geist, Marlos Machado, Pablo Samuel Castro, Nicolas Le Roux. *International Conference on Artificial Intelligence and Statistics (AISTATS), 2022* **(Best Paper Honorable Mention)**.
"Workshop on Reinforcement Learning Theory", ICML 2021.

15. "Stochastic Polyak Step-size for SGD: An Adaptive Learning Rate for Fast Convergence", Nicolas Loizou, **Sharan Vaswani**, Issam Laradji, Simon Lacoste-Julien. *International Conference on Artificial Intelligence and Statistics (AISTATS), 2021.*
"Optimization for Machine Learning" workshop, NeurIPS, 2020 **(Spotlight)**.

16. "Fast and Furious Convergence: Stochastic Second Order Methods under Interpolation", Si Yi Meng*, **Sharan Vaswani***, Issam Laradji, Mark Schmidt, Simon Lacoste-Julien. *International Conference on Artificial Intelligence and Statistics (AISTATS), 2020.*
"Beyond First Order Methods in Machine Learning" workshop, NeurIPS 2019 **(Spotlight)**.

17. "Old Dog Learns New Tricks: Randomized UCB for Bandit Problems", **Sharan Vaswani**, Abbas Mehrabian, Audrey Durand, Branislav Kveton. *International Conference on Artificial Intelligence and Statistics (AISTATS), 2020.*

18. "Painless Stochastic Gradient: Interpolation, Line-Search, and Convergence Rates", **Sharan Vaswani**, Aaron Mishkin, Issam Laradji, Mark Schmidt, Gauthier Gidel, Simon Lacoste-Julien. *Neural Information Processing Systems (NeurIPS), 2019.*

19. "Garbage In, Reward Out: Bootstrapping Exploration in Multi-Armed Bandits", Branislav Kveton, Csaba Szepesvári, **Sharan Vaswani**, Zheng Wen, Mohammad Ghavamzadeh, Tor Lattimore. *International Conference on Machine Learning (ICML), 2019.*

20. "Fast and Faster Convergence of SGD for Over-Parameterized Models and an Accelerated Perceptron", **Sharan Vaswani**, Francis Bach, Mark Schmidt. *International Conference on Artificial Intelligence and Statistics (AISTATS), 2019.*

21. "Online Influence Maximization under Independent Cascade Model with Semi-Bandit Feedback", Zheng Wen, Branislav Kveton, Michal Valko, **Sharan Vaswani**. *Neural Information Processing Systems (NIPS), 2017.*

22. "Model-Independent Online Learning for Influence Maximization", **Sharan Vaswani**, Branislav Kveton, Zheng Wen, Mohammad Ghavamzadeh, Laks Lakshmanan, Mark Schmidt. *International Conference on Machine Learning (ICML), 2017.*

23. "Horde of Bandits using Gaussian Markov Random Fields", **Sharan Vaswani**, Mark Schmidt, Laks Lakshmanan. *International Conference on Artificial Intelligence and Statistics (AISTATS), 2017.* **(Oral Presentation)**

24. "Modeling Non-Progressive Phenomena for Influence Propagation", Vincent Yun Lou, Smriti Bhagat, Laks Lakshmanan, **Sharan Vaswani**. *ACM Conference on Online Social Networks (COSN), 2014.*

25. "Performance Evaluation of Medical Imaging Algorithms on Intel MIC Platform", Jyotsna Khemka, Mrugesh Gajjar, **Sharan Vaswani**, Nagavijayalakshmi Vydyanathan, Rama Malladi, Vinutha V. *IEEE International Conference on High Performance Computing (HiPC), 2013.*

26. "Fast 3D Structure Localization in Medical Volumes using CUDA-enabled GPUs", **Sharan Vaswani**, Rahul Thota, Nagavijayalakshmi Vydyanathan, Amit Kale. *IEEE International Conference on Parallel, Distributed and Grid Computing, 2012.* **(Best Paper Award)**

Peer-reviewed Journal Publications

1. "Noise-adaptive (Accelerated) Stochastic Heavy-Ball Momentum", Anh Dang, Reza Babanezhad, **Sharan Vaswani**, *Transactions on Machine Learning Research, 2025.*
"Optimization for Machine Learning" workshop, NeurIPS, 2023.

2. "SVRG meets AdaGrad: Painless Variance Reduction", Benjamin Dubois-Taine*, **Sharan Vaswani***, Reza Babanezhad, Mark Schmidt, Simon Lacoste-Julien. *Machine Learning Journal, 2022.*

3. "Combining Bayesian Optimization and Lipschitz Optimization", Mohamed Osama Ahmed, **Sharan Vaswani**, Mark Schmidt. *Machine Learning Journal, 2020.*

4. "Fast 3D Salient Region Detection in Medical Images using GPUs", Thota, Rahul, **Sharan Vaswani**, Amit Kale, Nagavijayalakshmi Vydyanathan. *Machine Intelligence and Signal Processing. Springer India, 2016.*

Peer-reviewed Workshop Publications

1. "Optimistic Actor-Critic with Parametric Policies: Unifying Sample Efficiency and Practicality", Max Qiushi Lin, Reza Asad, Kevin Tan, Haque Ishfaq, Csaba Szepesvari, **Sharan Vaswani**, Workshop on Aligning Reinforcement Learning Experimentalists and Theorists (ARLET), NeurIPS, 2025. (*Under conference submission*)

2. "Towards Parameter-Free Temporal Difference Learning", Yunxiang Li, Mark Schmidt, Reza Babanezhad, **Sharan Vaswani**, Workshop on Aligning Reinforcement Learning Experimentalists and Theorists (ARLET), NeurIPS, 2025.(*Under conference submission*)

3. "Revisiting Actor-Critic Methods in Discrete Action Off-Policy Reinforcement Learning", Reza Asad, Reza Babanezhad, **Sharan Vaswani**, Workshop on Aligning Reinforcement Learning Experimentalists and Theorists (ARLET), NeurIPS, 2025. (*Under conference submission*)

4. "Implicit Bias of Polyak and Line-Search Step Sizes on Linear Classification with Separable Data", Chen Fan, Reza Babanezhad, Christos Thrampoulidis, Mark Schmidt, **Sharan Vaswani**, Optimization for Machine Learning (OPT) workshop, NeurIPS, 2025.

5. "Improving OOD Generalization of Pre-trained Encoders via Aligned Embedding-Space Ensembles", Shuman Peng, Arash Khoeini, **Sharan Vaswani**, Martin Ester, "Unifying Representations in Neural Models (UniReps)" workshop, "Self-supervised Learning (SSL) workshop", NeurIPS, 2024.

6. "Surrogate Minimization: An Optimization Algorithm for Training Large Neural Networks with Model Parallelism", Reza Asad, Reza Babanezhad, Issam Laradji, Nicolas Le Roux, **Sharan Vaswani**. "Optimization for Machine Learning" workshop, NeurIPS, 2023.

7. "MSL: An Adaptive Momentem-based Stochastic Line-search Framework", Chen Fan, **Sharan Vaswani**, Christos Thrampoulidis, Mark Schmidt. "Optimization for Machine Learning" workshop, NeurIPS, 2023.

8. "Adaptive Gradient Methods Converge Faster with Over-Parameterization (but you should do a line-search)", **Sharan Vaswani**, Issam Laradji, Frederik Kunstner, Si Yi Meng, Mark Schmidt, Simon Lacoste-Julien. "Optimization for Machine Learning" workshop, NeurIPS, 2020 **(Spotlight)**.

9. "How to Make Your Optimizer Generalize Better", **Sharan Vaswani**, Reza Babanezhad, Jose Gallego, Aaron Mishkin, Simon Lacoste-Julien, Nicolas Le Roux. "Optimization for Machine Learning" workshop, NeurIPS, 2020 **(Spotlight)**.

10. "Accelerating boosting via accelerated greedy coordinate descent", Xiaomeng Ju*, Yifan Sun*, **Sharan Vaswani***, Mark Schmidt. "Optimization for Machine Learning" workshop, NeurIPS 2019.

11. "Influence Maximization with Bandits", **Sharan Vaswani**, Laks Lakshmanan, Mark Schmidt. "Networks in Social and Information Sciences" workshop, NIPS, 2015.

Preprints

1. "Glocal Smoothness: Line Search can really help!", Curtis Fox, Aaron Mishkin, **Sharan Vaswani**, Mark Schmidt. ArXiv, 2025. (*Under journal submission*).

2. "Rethinking the Global Convergence of Softmax Policy Gradient with Linear Function Approximation", Max Qiushi Lin, Jincheng Mei, Matin Aghaei, Michael Lu, Bo Dai, Alekh Agarwal, Dale Schuurmans, Csaba Szepesvari, **Sharan Vaswani**. ArXiv, 2025. (*Under journal submission*).

3. "New Insights into Bootstrapping for Bandits", **Sharan Vaswani**, Branislav Kveton, Zheng Wen, Anup Rao, Mark Schmidt, Yasin Abbasi-Yadkori. ArXiv, 2018.

4. "Adaptive Influence Maximization in Social Networks: Why Commit when You can Adapt?", **Sharan Vaswani**, Laks V.S. Lakshmanan. ArXiv, 2016.

Awards

- Discovery Grant awarded by the Natural Sciences and Engineering Research Council of Canada (2022-2027) [$157,500$ CAD for 5 years].

- Postdoctoral Scholarship awarded by The Institute for Data Valorization (IVADO) (2019 - 2020).

- Four Year Doctoral Fellowship awarded by the University of British Columbia (2015 - 2018).

- Merit Scholarship awarded by the Birla Institute of Technology and Science, Pilani (2008-2010).

- Travel award for AISTATS 2017, ICML 2017-2019, NeurIPS 2017, 2019.

- Outstanding reviewer for ICLR 2021, ICML 2021, 2022.

- Top 30% of highest scoring reviewers for NeurIPS 2018, 2019.

Teaching

Simon Fraser University

Instructor *2022-*

- CMPT 210: Probability and Computing (undergraduate course)

    * Summer, 2022. Class size: 50.
    * Spring, 2023. Class size: 41.
    * Spring, 2024. Class size: 71.
    * Fall, 2024. Class size: 199.
    * Fall, 2025. Class size: 200.

- CMPT 409/981: Optimization for Machine Learning (cross-listed undergraduate/graduate course)

    * Fall, 2022. Class size: 33 (5 undergraduate students, 28 graduate students).
    * Fall, 2024. Class size: 23 (9 undergraduate students, 14 graduate students).
    * Fall, 2025. Class size: 18 (8 undergraduate students, 10 graduate students).

- CMPT 419/983: Theoretical Foundations of Reinforcement Learning (cross-listed undergraduate/graduate course)

    * Fall, 2023. Class size: 25 (6 undergraduate students, 19 graduate students).

University of British Columbia

Teaching Assistant *2013-2018*

- Theory of Computation (2013), Computational Optimization (2014), Artificial Intelligence (2014).
- Undergraduate Machine learning (2015, 2017, 2018).
- Graduate Machine learning (2016, 2017).

Birla Institute of Technology and Science, Pilani

Teaching Assistant *2011*

- Data Structures and Algorithms (2011)

Supervision

- Students supervised (as the primary supervisor at Simon Fraser University)

    - Qiushi Lin, PhD
    - Ahmed Shehata, PhD
    - Reza Asad, PhD (co-supervised with Manolis Savva)
    - Michael Lu, PhD (co-supervised with Mo Chen)
    - Xingtu Liu, MSc, 2025. *Thesis*: Sample Complexity Bounds for Linear Constrained MDPs with a Generative Model.
    - Matin Aghaei, MSc, 2025. *Thesis*: Convergence of Softmax Policy Gradient: Incorporating Entropy Regularization and Handling Linear Function Approximation. *Next position*: Huawei
    - Anh Dang, MSc, 2024. *Thesis*: (Accelerated) Noise-adaptive Stochastic Heavy-Ball Momentum. *Next position*: Amazon
    - Saurabh Mishra, MSc, 2024. *Thesis*: From Inverse Optimization to Feasibility to Empirical Risk Minimization. *Next position*: Huawei

- Students mentored/unofficially co-supervised (as Assistant Professor):

  ○ Yunxiang Li, PhD, University of British Columbia. Supervisor: Mark Schmidt.

  ○ Chen Fan, PhD, University of British Columbia. Supervisors: Mark Schmidt, Christos Thrampoulidis.

  ○ Amirreza Kazemi, MSc, Simon Fraser University. Supervisor: Martin Ester.
  Next position: Huawei

  ○ Jonathan Lavington, PhD, University of British Columbia. Supervisor: Mark Schmidt.
  Next position: Amazon.

  ○ Valentin Tiriac, MSc, University of Alberta. Supervisor: Csaba Szepesvári.

  ○ Arushi Jain, PhD, Mila, McGill University. Supervisor: Doina Precup.

- Students mentored/unofficially co-supervised (as Postdoctoral Researcher):

  ○ Si Yi Meng, MSc, University of British Columbia. Supervisor: Mark Schmidt.
  Next position: PhD, Cornell University.

  ○ Aaron Mishkin, MSc, University of British Columbia. Supervisor: Mark Schmidt.
  Next position: PhD, Stanford University.

  ○ Benjamin Paul-Dubois-Taine, MSc, Paris-Saclay University. Supervisor: Alessandro Rudi.
  Next position: PhD, Paris-Saclay University.

  ○ Shivam Garg, Research assistant, University of Alberta. Supervisor: Csaba Szepesvári.
  Next position: PhD, University of Alberta.

  ○ Jose Gallego, PhD, Mila, Université de Montréal. Supervisor: Simon Lacoste-Julien.

  ○ Frederik Kunstner, PhD, University of British Columbia. Supervisor: Mark Schmidt.
  Next position: Postdoc, Inria Paris.

- Committee Member (at Simon Fraser University)

  ○ Shuman Peng, Ph.D. Supervisor: Martin Ester.

  ○ Sriraj Meenavilli, MSc, 2023. Supervisor: Mo Chen.

  ○ Amirreza Kazemi, MSc, 2023. Supervisor: Martin Ester

- Examiner (at Simon Fraser University)

  ○ Seyed Roozbeh Razavi Rohani, PhD. Supervisor: Mo Chen

  ○ Dekai Lin, MSc, 2023. Supervisor: Ke Wang

- External Examiner

  ○ Stephen Scinocca, MSc, 2022. University of Victoria. Supervisor: Nishant Mehta.

Internal Service

- Member of Undergraduate Program committee (Jan'22 - August'22), Graduate Program committee (September'22 - Present) at Simon Fraser University.

- Volunteer in the UBC Computer Science Graduate Admissions committee for 2016-2017, 2017-2018.

- Student representative in the UBC Computer Science Faculty Recruiting committee for 2015-2016.

- Co-organizer of reading groups at UBC: Machine learning (2018), Deep learning (2015).

External Service

- Organizer of the "Mathematics of Machine Learning" research theme at the 2022 annual meeting of the Canadian Applied and Industrial Mathematics Society.

- External Reviewer for NSERC Arthur B. McDonald Fellowship, 2025.

- Conference Area Chair: NeurIPS'22-'25; ICML'23-'26; AAAI'25-'26, RLC'25

- Reviewer: JMLR'18-'23, AISTATS'19 - '21, ICLR'18-'21, ICML'17-'22, IEEE TNNLS, NeurIPS'17-'21, New In ML workshop (NeurIPS'19), OPT-ML workshop (NeurIPS'20 - '21).

- Conference volunteer for NIPS'16.

- Conference sub-reviewer for SIGMOD'18, AAAI'17,'18, WWW'17, SDM'15,'17, KDD'16,'17, ICDM'14.

- Contributor to the Optimization chapter of the "Machine Learning, Second Edition: A Probabilistic Perspective" book by Kevin Murphy.

Other Employment

Inria Paris — Paris, France
Intern — *May - July, 2018*
  ◦ Supervisor: Francis Bach

Apple — Seattle, USA
Intern — *June - August, 2017*
  ◦ Supervisors: Hoyt Koepke, Srikrishna Sridhar

Limespot — Vancouver, Canada
Machine Learning Consultant — *March - May 2017; Sept - Oct, 2017*

Adobe Research — San Jose, USA
Data Scientist Intern — *August - Oct, 2016*
  ◦ Supervisors: Branislav Kveton, Zheng Wen, Mohammad Ghavamzadeh

Siemens Corporate Research and Technologies — Bangalore, India
Research Engineer, Parallel Systems — *July 2012 - June 2013*
  ◦ Supervisors: Nagavijayalakshmi Vydyanathan, Amit Kale, Saptarshi Das

Research Intern, Parallel Systems — *January - June, 2012*
  ◦ Supervisors: Nagavijayalakshmi Vydyanathan, Amit Kale

Indira Gandhi Centre for Atomic Research — Kalpakkam, India
Intern — *May 2010 - July 2010*
  ◦ Supervisor: M.L. Jayalal

Patents

- "Influence Maximization Determination in a Social Network System", **Sharan Vaswani**, Branislav Kveton, Zheng Wen, Mohammad Ghavamzadeh. US Patent App. 15/611,597, 2018.

Invited Talks

- "A Systematic Framework for Designing Policy Gradient Methods: The Case of Softmax Policy Mirror Ascent"

  - Google DeepMind, London, June 2025.

- "From Inverse Optimization to Feasibility to ERM"

  - INFORMS Computing Society Conference (ICS), Toronto, March 2025.
  - INFORMS Annual Meeting, Seattle, October 2024.

- "Global Convergence of Softmax Policy Gradient for Stochastic Bandits"

  - Canadian Mathematical Society Winter Meeting, Vancouver, November 2024.

- "Towards Principled, Practical Policy Gradient for Bandits and Tabular MDPs"

  - Theory of RL Workshop, Alberta, June 2024.

- "A Walk with SGD: Interpolation, Problem and Noise Adaptivity"

  - Department of Combinatorics and Optimization, University of Waterloo, January, 2024.

- "Exploiting Problem Structure for Efficient Optimization in Machine Learning"

  - Operations Research Seminar, Simon Fraser University, October, 2023.

- "Decision-Aware Actor-Critic with Function Approximation and Theoretical Guarantees"

  - Vector Institute, Toronto, June, 2023.

- "Target-based Surrogates for Efficient Sequential decision-making"

  - Microsoft Research, Montreal, June, 2023.
  - AI Seminar, Simon Fraser University, March 2023.

- "A general class of surrogate functions for stable and efficient reinforcement learning"

  - Theory of RL Workshop, Alberta, May 2023.
  - RL Seminar, Mila, Montreal, March 2022.
  - Facebook AI Research, Paris, April 2022.

- "Towards Noise-adaptive, Problem-adaptive Stochastic Gradient Descent"

  - Siam Conference on Optimization, Seattle, June 2023.
  - Optimization Seminar, Mila, Montreal, November 2021.
  - RWTH Aachen University, April, 2022.

- "Rethinking Stochastic Optimization for Modern Machine Learning"

  - Simon Fraser University, Vancouver, March 2021.

- York University, Toronto, March 2021.
- West Coast Optimization Meeting, Okanagan, May 2021.
- SIAM Conference on Optimization, July, 2021.

- "Old Dog Learns New Tricks: Randomized UCB for Bandit Problems", RL Seminar, Mila, Montreal, August 2020.

- "Painless Stochastic Gradient: Interpolation, Line-Search, and Convergence Rates"

    - Huawei Research, Montreal, October 2019.
    - Optimization Seminar, Mila, Montreal, August 2019.
    - Element AI, Montreal, July 2019.
    - Google Brain, Montreal, July 2019.

- "Influence Maximization with Bandits", UBC-Element AI workshop, August, 2018.

- "New Insights into Bootstrapping for Bandits", Inria Paris, May 2018.