Sharan Vaswani
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Current Position

- **School of Computing Science, Simon Fraser University** — Vancouver, Canada
  Assistant Professor — *January 2022 -*

Education

- **University of British Columbia** — Vancouver, Canada
  Doctor of Philosophy (Computer Science) — *Sep 2015 - Dec 2018*
  - Supervisors: Mark Schmidt, Laks Lakshmanan
  - Thesis: Structured Bandits and Applications
- **University of British Columbia** — Vancouver, Canada
  Master of Science (Computer Science) — *Sep 2013 - July 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) — *Aug 2008 - July 2012*
  - GPA: 9.37 / 10

Publications

- **Large-scale optimization**

  [W] "Towards Noise-adaptive, Problem-adaptive (Accelerated) Stochastic Gradient Descent", **Sharan Vaswani**, Benjamin Dubois-Taine, Reza Babanezhad. "Optimization for Machine Learning" workshop, NeurIPS, 2021. *Under conference submission.*

  [R] "SVRG meets AdaGrad: Painless Variance Reduction", Benjamin Dubois-Taine*, **Sharan Vaswani***, Reza Babanezhad, Mark Schmidt, Simon Lacoste-Julien. arXiv, 2021. *Under submission.*

  [W] "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)**.

  [C] "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)**.

  [W] "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)**.

  [C] "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)**.

C: Conference, **W**: Workshop, **J**:Journal, **R**:Technical report.
* Equal contribution.

[C] "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.

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

[C] "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.

- **Sequential decision-making**

[R] "Towards Painless Policy Optimization for Constrained MDPs", Arushi Jain*, **Sharan Vaswani***, Reza Babanezhad, Doina Precup, Csaba Szepesvari, arXiv, 2022. *Under submission.*

[C] "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.

[C] "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.

[J] "Combining Bayesian Optimization and Lipschitz Optimization", Mohamed Osama Ahmed, **Sharan Vaswani**, Mark Schmidt. European Conference on Machine Learning (ECML) Journal Track, 2020.

[C] "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.

[R] "New Insights into Bootstrapping for Bandits", **Sharan Vaswani**, Branislav Kveton, Zheng Wen, Anup Rao, Mark Schmidt, Yasin Abbasi-Yadkori. arXiv:1805.09793, 2018.

[C] "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.

[C] "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.

[C] "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)**

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

- **Social Networks**

[R] "Adaptive Influence Maximization in Social Networks: Why Commit when You can Adapt?", **Sharan Vaswani**, Laks V.S. Lakshmanan. arXiv:1604.08171, 2016.

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

- **Parallel Computing**

  [C] "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.

  [J] "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.

  [C] "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)**

Teaching & Supervision

- Teaching assistant:
  - Algorithms (2011), Theory of computation (2013), Computational optimization (2014), Artificial intelligence (2014).
  - Undergraduate Machine learning (2015, 2017, 2018).
  - Graduate Machine learning (2016, 2017).
- Students mentored/co-supervised:
  - Si Yi Meng, MSc, 2018-2020, University of British Columbia. Supervisor: Mark Schmidt. *Current position*: PhD, Cornell University.
  - Aaron Mishkin, MSc, 2018-2020, University of British Columbia. Supervisor: Mark Schmidt. *Current position*: PhD, Stanford University.
  - Benjamin Paul-Dubois-Taine, MSc, 2020-21, Paris-Saclay University. Supervisor: Alessandro Rudi. *Current position*: PhD, Paris-Saclay University.
  - Jose Gallego, PhD, 2018-. Mila, Université de Montréal. Supervisor: Simon Lacoste-Julien.
  - Valentin Tiriac, MSc, 2020-, University of Alberta. Supervisor: Csaba Szepesvári.
  - Kenneth Tjhia, MSc, 2020-, University of Alberta. Supervisor: Csaba Szepesvári.
  - Shivam Garg, Research assistant, University of Alberta. Supervisor: Csaba Szepesvári.
  - Arushi Jain, PhD, 2018-, Mila, McGill University. Supervisor: Doina Precup.
  - Frederik Kunstner, PhD, 2019-, University of British Columbia. Supervisor: Mark Schmidt.
  - Jonathan Lavington, PhD, 2018-, University of British Columbia. Supervisor: Mark Schmidt.

Service

- Organizer of the "Mathematics of Machine Learning" research theme at the 2022 annual meeting of the Canadian Applied and Industrial Mathematics Society.
- Contributor to the Optimization chapter of the "Machine Learning, Second Edition: A Probabilistic Perspective" book by Kevin Murphy.
- Conference reviewer: AISTATS'19 - '21, ICLR'18-'21, ICML'17-'22, JMLR'18-'21, IEEE TNNLS, NeurIPS'17-'21, New In ML workshop (NeurIPS'19), OPT-ML workshop (NeurIPS'20 - '21).
- 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.

- Conference volunteer for NIPS'16.
- Co-organizer of reading groups at UBC: Machine learning (2018), Deep learning (2015).
- Conference sub-reviewer for SIGMOD'18, AAAI'17,'18, WWW'17, SDM'15,'17, KDD'16,'17, ICDM'14.

Awards

- 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 (Top 12%) for ICLR 2021, ICML 2021.
- Top 30% of highest scoring reviewers for NeurIPS 2018, 2019.

Employment

- **University of Alberta** — Edmonton, Canada
  Postdoctoral Researcher — *November 2020 - December, 2021*
  - Supervisor: Csaba Szepesvári
- **Mila, Université de Montréal** — Montreal, Canada
  Postdoctoral Researcher — *January 2019 - October, 2020*
  - Supervisor: Simon Lacoste-Julien
- **Inria Paris** — Paris, France
  Intern — *May 2018 - July, 2018*
  - Supervisor: Francis Bach
- **Apple** — Seattle, USA
  Intern — *June 2017 - August, 2017*
  - Supervisors: Hoyt Koepke, Srikrishna Sridhar
- **Limespot** — Vancouver, Canada
  Machine Learning Consultant — *March - May 2017; Sept, 2017 - Oct, 2017*
- **Adobe Research** — San Jose, USA
  Data Scientist Intern — *Aug 2016 - Oct 2016*
  - Supervisors: Branislav Kveton, Zheng Wen, Mohammad Ghavamzadeh
- **University of British Columbia** — Vancouver, Canada
  Teaching Assistant — *Sep 2013 - Dec 2018*
- **Siemens Corporate Research and Technologies** — Bangalore, India
  Research Engineer, Parallel Systems — *July 2012 - June 2013*
  - Supervisors: Nagavijayalakshmi Vydyanathan, Amit Kale, Saptarshi Das
- **Siemens Corporate Research and Technologies** — Bangalore, India
  Research Intern, Parallel Systems — *January 2012 - June 2012*
  - Supervisors: Nagavijayalakshmi Vydyanathan, Amit Kale
- **Birla Institute of Technology and Science, Pilani** — Goa, India
  Teaching Assistant — *Aug 2012 - Dec 2012*
- **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.

Talks

- "A general class of surrogate functions for stable and efficient reinforcement learning"
  - Mila, Montreal, March 2022.
  - Facebook AI Research, Paris, April 2022.
- "Towards Noise-adaptive, Problem-adaptive Stochastic Gradient Descent"
  - 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", Mila, Montreal, August 2020.
- "Painless Stochastic Gradient: Interpolation, Line-Search, and Convergence Rates"
  - Huawei Research, Montreal, October 2019.
  - 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.
- "Model-Independent Online Learning for Influence Maximization", International Conference on Machine Learning, 2017.
- "Horde of Bandits using Gaussian Markov Random Fields", International Conference on Artificial Intelligence and Statistics, 2017.
- "Modeling Non-Progressive Phenomena for Influence Propagation" Conference on Online Social Networks, 2014.
- "Fast 3D Structure Localization in Medical Volumes using CUDA-enabled GPUs", International Conference on Parallel, Distributed and Grid Computing, 2012.

References

- Mark Schmidt (schmidtm@cs.ubc.ca), Associate Professor, University of British Columbia.
- Csaba Szepesvári (csaba.szepesvari@gmail.com), Professor, University of Alberta.
- Nicolas Le Roux (nicolas.le.roux@gmail.com), Research Scientist, Microsoft Research.
- Simon Lacoste-Julien (slacoste@iro.umontreal.ca), Associate Professor, Université de Montréal.