Sattar Vakili

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Education

2017 **Ph.D. in Electrical and Computer Engineering** with a **Minor Degree in Applied Mathematics**, **Cornell University**, Ithaca, NY.
Thesis: Sequential Methods for Learning and Inference Under Unknown Models

2013 **M.S.** in Electrical and Computer Engineering, University of California, Davis, CA.

2011 **B.Sc.** in Electrical Engineering, Sharif University of Technology (SUT), Tehran, Iran.

Employment

2020 - Senior AI Researcher, **MediaTek Research**, Cambridge, UK.

MediaTek Research is the research arm of MediaTek (4th largest global fabless semiconductor company). As a senior researcher, I lead research and development in AI with applications in automated decision making systems. As part of my responsibilities, I mentor junior researchers and research interns. We publish our research findings in top AI and ML conferences.

2018 - 2020 Senior ML Researcher, **Secondmind Labs**, Cambridge, UK.

As a senior researcher, I led research and development with a focus on probabilistic non-parametric models, multi-agent systems and reinforcement learning. I mentored junior researchers, ML engineers and research interns.

2017 - 2018 Postdoctoral Research Associate, Electrical Engineering Department, **Princeton University**, Princeton, NJ.

During my postdoctoral research, I worked on distributed learning and optimization for embedded systems in communication networks, in collaboration with BAE Systems.

Publications

Preprints:

2023 S. Salgia, **S. Vakili**, Q. Zhao, "Kernel-based Federated Learning with Personalization," Available on **arXiv**.

Published:

2023 **S. Vakili**, D. Ahmed, A. Bernacchia, C. Pike-Burke, "Delayed Feedback in Kernel Bandits," International Conference on Machine Learning (**ICML 2023, Oral presentation**).

2023 A. Das, S. Fotiadis, A. Batra, F. Nabiei, F. Liao, **S. Vakili**, D. Shiu, A. Bernacchia, "Image generation with shortest path diffusion," International Conference on Machine Learning (**ICML 2023**).

2023 **S. Vakili**, J. Olkhovskaya, "Kernelized Reinforcement Learning with Order Optimal Regret Bounds," European Workshop on Reinforcement Learning (**EWRL 2023**).

2023 S. Salgia, **S. Vakili**, Q. Zhao, "Provably and Practically Efficient Neural Contextual Bandits," International Conference on Machine Learning (**ICML 2023**).

2023 J. Garcia, F. Freddi, S. Fotiadis, M. Li, **S. Vakili**, A. Bernacchia, G. Hennequin, "Fisher-Legendre (FishLeg) optimization of deep neural networks," International Conference on Learning Representations (**ICLR 2023**).

2022 S. Yeh, F. Chang, C. Yueh, P. Wu, A. Bernacchia, **S. Vakili**, "Sample Complexity of Kernel-Based Q-Learning," International Conference on Artificial Intelligence and Statistics (**AISTATS 2023**).

2023 **S. Vakili**, M. Bromberg, J. Garcia, D. Shiu, A. Bernacchia, "Uniform Generalization Bounds for Overparameterized Neural Networks," IEEE International Symposium on Information Theory (**ISIT 2023**).

2023 U. Sengupta, C. Jao, A. Bernacchia, **S. Vakili**, D. Shiu, "Generative Diffusion Models for Radio Wireless Channel Modelling and Sampling," IEEE Global Communications Conference (**GLOBECOM 2023**).

2022 F. Chang, F. Nabiei, P. Wu, A. Cioba, **S. Vakili**, A. Bernacchia, "Gradient Descent: Robustness to Adversarial Corruption," International OPT Workshop on Optimization for Machine Learning at **NeurIPS 2022**.

2022 C. Réda, **S. Vakili**, E. Kaufmann, "Near-Optimal Collaborative Learning in Bandits," Conference on Neural Information Processing Systems (**NeurIPS 2022, Oral presentation**).

2022 **S. Vakili**, J. Scarlett, D. Shiu, A. Bernacchia, "Improved Convergence Rates for Sparse Approximation Methods in Kernel-Based Learning," International Conference on Machine Learning (**ICML 2022, Spotlight presentation**).

2022 **S. Vakili**, "Regret bounds for noise-free kernel-based bandits," Conference on Learning Theory (**COLT 2022**).

2021 **S. Vakili**, H. Moss, A. Artemev, V. Dutordoir, V. Picheny, "Scalable Thompson Sampling using Sparse Gaussian Process Models," Conference on Neural Information Processing Systems (**NeurIPS 2021**).

2021 **S. Vakili**, N. Bouziani, S. Jalali, A. Bernacchia, DS Shiu, "Optimal Order Simple Regret for Gaussian Process Bandits," Conference on Neural Information Processing Systems (**NeurIPS 2021**).

2021 S. Salgia, **S. Vakili**, Qing Zhao, "A Domain-Shrinking based Bayesian Optimization Algorithm with Order-Optimal Regret Performance," Conference on Neural Information Processing Systems (**NeurIPS 2021**).

2021 **S. Vakili**, J. Scarlett, T. Javidi, "Open Problem: Tight Online Confidence Intervals for RKHS Elements," Conference on Learning Theory (**COLT 2021**).

2021 **S. Vakili**, K. Khezeli, V. Picheny, "On Information Gain and Regret Bounds in Gaussian Process Bandits," International Conference on Artificial Intelligence and Statistics (**AISTATS 2021**).

2021 F. Perotto, **S. Vakili**, Y. Kord, P. Gajane and M. Bourgais, "Gambler Bandits and the Regret of Being Ruined," International Conference on Autonomous Agents and Multiagent Systems (**AAMAS 2021**).

2020 S. Salgia, Q. Zhao, **S. Vakili**, "Stochastic Coordinate Minimization with Progressive Precision for Stochastic Convex Optimization," International Conference on Machine Learning (**ICML 2020**).

2020 A. Boustati, **S. Vakili**, J. Hensman, ST John, "Amortized Variance Reduction for Doubly Stochastic Objectives", Conference on Uncertainty in Artificial Intelligence (**UAI 2020**).

2019 **S. Vakili**, A. Boukouvalas, Q. Zhao, "Decision Variance in Online Learning", Conference on Decision and Control (**CDC 2019**).

2019 X. Xu, **S. Vakili**, Q. Zhao, A. Swami, "Multi-Armed Bandits on Unit Interval Graphs", **IEEE Transactions** on Network Science and Engineering.

2019 G. Grant, A. Boukouvalas, D. Leslie, **S. Vakili**, E. Munoz, "Adaptive Sensor Placement for Continuous Spaces", International Conference on Machine Learning (**ICML 2019, Oral presentation**).

2019 S. Vakili, Q. Zhao, "A Random Walk Approach to First-Order Stochastic Convex Optimization", International Symposium on Information Theory (**ISIT 2019**).

2019 S. Vakili, S. Salgia, Q. Zhao, "Stochastic Gradient Descent on a Tree: An Adaptive and Robust Approach to Stochastic Convex Optimization", Annual Allerton Conference on Communication, Control, and Computing (**Allerton 2019**).

2018 **S. Vakili**, Q. Zhao, "Acive Learning on a Tree," Annual Allerton Conference on Communication, Control, and Computing (**Allerton 2018**).

2018 **S. Vakili**, Q. Zhao, C. Liu, C.-N. Chuah, "Hierarchical Heavy Hitter Detection under Unknown Models", IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP 2018**).

2017 X. Xu, **S. Vakili**, Q. Zhao, A. Swami, "Online Learning with Side Information," IEEE Military Communication Conference (**MILCOM 2017**).

2016 **S. Vakili**, Q. Zhao, "Risk-Averse Multi-Armed Bandit Problems under Mean-Variance Measure", Journal of Selected Topics in Signal Processing: *Special Issue on Financial Signal Processing and Machine Learning for Electronic Trading*.

2015 **S. Vakili**, Q. Zhao, "Mean Variance and Value at Risk in Multi-Armed Bandit Problems," Annual Allerton Conference on Communication, Control, and Computing (**Allerton 2015**).

2015 **S. Vakili**, Q. Zhao, L. Tong, "Bayesian Quickest Short-term Voltage Instability Detection in Power Systems," IEEE Conference on Decision and Control (**CDC 2015**).

2015 **S. Vakili**, Q. Zhao, "Risk-Averse Online Learning under Mean-Variance Measures," IEEE International Conference on Acoustics, Speech, and Signal Processing (**ICASSP 2015**).

2015 **S. Vakili**, Q. Zhao, L. Tong, "Quickest Detection of Short-Term Voltage Instability with PMU Measurements," IEEE International Conference on Acoustics, Speech, and Signal Processing (**ICASSP 2015**).

2014 **S. Vakili**, Q. Zhao, Y. Zhou, "Time-Varying Stochastic Multi-Armed Bandit," IEEE Asilomar Conference on Signals, Systems, and Computers, (**Asilomar 2014**).

2013 **S. Vakili**, Q. Zhao, "Distributed Node-Weighted Connected Dominating Set Problems," IEEE Asilomar Conference on Signals, Systems, and Computers (**Asilomar 2013**).

2013 **S. Vakili**, K. Liu, Q. Zhao, "Deterministic Sequencing of Exploration and Exploitation for Multi-Armed Bandit Problems", Journal of Selected Topics in Signal Processing.

2013 **S. Vakili**, Q. Zhao, "Achieving Complete Learning in Multi-Armed Bandit Problems," IEEE Asilomar Conference on Signals, Systems, and Computers (**Asilomar 2013**).

Patent Applications:

2020 A. Boustati, S. John, **S. Vakili**, J. Hensman, "Computational Inference System", US Patent Application 16/984,824, European Patent Application EP19192404.2A.

2019 J. Grant, A. Boukouvalas, D. Leslie, E. Munoz, S. John, **S. Vakili**, "Method and system for adaptive sensor arrangement", European Patent Application EP19160156.6A.

Other achievements and professional activities

2018 Endorsed as an *exceptional talent* in *machine learning and data science* by Tech Nation (formerly known as Tech City UK).

2021 Chaired the RL, Bandit and Control session at conference on learning theory (COLT), 2021.

2020-2022 Organised Trends in AI theory seminar series in collaboration with National Taiwan University (NTU). Some recordings are available at YouTube.com/channel/UCJFJOK8mn27Iq8n3ECGfQXA.

2018-2022 Invited papers to several conferences:

- 2022 IEEE Information Theory Workshop (ITW), Mumbai, India;
- 56th and 57th Annual Allerton Conferences on Communication, Control, and Computing, IL, USA;
- INFORMS Annual Meeting, Phoenix, AZ, USA;

- 43rd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Calgary, Alberta, Canada;

2014-2022 Peer reviewed papers submitted to:

◇ Several IEEE transactions, journals and conferences,
◇ AISTATS,
◇ ICLR,
◇ AAAI,
◇ ICML,
◇ NeurIPS,
◇ Conference on Information Science and Systems,
◇ American Control Conference,
◇ European Journal of Operational Research,
◇ Institute of Industrial and Systems Engineers (IISE) transaction.

2020-2021 Received top reviewer grant from NeurIPS 2020 and NeurIPS 2021.

2018 Member of the technical program committee of the 52nd Annual Conference on Information Sciences and Systems (CISS), Princeton University, Princeton, NJ.

2015 2015-16 academic year graduate student fellowship, Cornell University, Ithaca, NY.

2011 Fall 2011 graduate student fellowship, University of California, Davis.