Rohan A. Varma

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Education

Carnegie Mellon University (2014 - 2019) • Ph.D Electrical and Computer Engineering. Advisor: Prof. Jelena Kovačević • M.Sc Electrical and Computer Engineering (2016)

> **Relevant Coursework**: · Machine Learning and Statistical Learning Theory · Deep Learning and Neural Networks · Convex Optimization · Computer Vision · Probabilistic Graphical Models · Probability Theory and Stochastic Processes · Multimedia Databases and Data Mining · Parallel Programming

University of California, Berkeley (2010 - 2014) • B.Sc Electrical Engineering and Computer Science • B.A Statistics • B.A Economics

Skills

- Programming experience in `Java, Python, C, C++, Julia, MATLAB, R, Haskell, and JavaScript`.
- Experience with the `TensorFlow, PyTorch, MapReduce, Hive, Spark and CUDA` platforms.
- Languages spoken- fluent: English, French, Hindi, Malayalam. Working fluency: German, Arabic.

Research

- I am broadly interested in machine (deep) learning, signal processing and interdisciplinary work drawing from tools in statistics and optimization. I am particularly interested in areas like semi-supervised learning, self-supervised learning, transfer learning, computer vision and perception.
- My thesis revolves around graph signal processing, graph-augmented machine learning and the semi-supervised and active sampling and reconstruction of graph-structured data.

Selected Publications

- **Varma, R.**, Singh, A. and Kovačević, J. (2019). *Active Sampling for Non-Smooth Signals on Graphs* IEEE Transactions on Signal Processing. (in preparation).
- **Varma, R.**, Lee, H., Chi, Y. and Kovačević, J. (2019). *Vector-Valued Graph Trend Filtering with Non-Convex Penalties* IEEE Transactions of Signal Processing.
- **Varma, R.** and Kovačević, J. (2019). *Passive and Active Sampling for Piecewise Smooth Graph Signals*. 13th International Conference on Sampling Theory and Applications
- **Varma, R.** and Kovačević, J. (2019). *Random Sampling for Bandlimited Signals on Product Graphs*. 13th International Conference on Sampling Theory and Applications
- **Varma, R.**, and Kovačević, J. (2019). *Smooth Signal Recovery on Product Graphs* IEEE International Conference on Acoustics, Speech and Signal Processing
- Chen, S., **Varma, R.**, Singh, A. and Kovačević, J. (2018). *Signal Representations on Graphs* arXiv:1512.05406.
- **Varma, R.**, Chen, S., and Kovačević, J. (2017). *Graph Topology Learning from Signals: Regular vs Irregular structures.* IEEE Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP).
- Chen, S., **Varma, R.**, Singh, A., and Kovačević, J. (2016).*Signal Recovery on Graphs: Fundamental Limits of Sampling Strategies.* IEEE Transactions on Signal and Information Processing over Networks
- **Varma, R.**, Chen, S., and Kovačević, J. (2015). *Spectrum-Blind Signal Recovery on Graphs.* IEEE Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP).
- Chen, S., **Varma, R.**, Sandryhaila, A., and Kovačević, J. (2015).*Discrete Signal Processing on Graphs: Sampling Theory.* IEEE Transactions on Signal Processing. ***(IEEE SPS Young Author Best Paper Award)***

Work Experience

Intern at **Microsoft Research** (Summer 2018)
- Worked on incorporating syntactic and semantic information in co-word and graph embeddings.

Intern at **Apple** (Summer 2013)
- Worked on the signal integrity team for the next generation of Apple devices.

Intern at **Samsung Electronics, Advanced Technology Laboratory** (Summer 2012)
- Worked on an application that enabled people to view their activity using accelerometer, gyroscope, GPS data for the mobile sensors team.

Past Research Experience

Research Assistant at **Wireless Foundations, U.C. Berkeley** (July 2013 - May 2014)
- Worked on a framework for low-rate sampling and recovery of spectrally sparse signals with Prof. Ramachandran.

Research Assistant at **U.C. Berkeley Wireless Research Center** (July 2012 - May 2013)
- Worked on lossless data compression block for neural signals on a brain-machine interface with Prof. Jan Rabaey.
- Worked on capacitive multi-dimensional imaging for high resolution depth-direction imaging with Prof. Ali Niknejad.

Relevant Projects

Using Multi-Task Learning to Predict Signaling and Regulatory Pathways, CMU (December 2014)
- Developed a machine learning framework for predicting signaling and regulatory pathways in cancer.

Variational Inference for Gamma-Process Corrosion Models, CMU (May 2016)
- Created a hierarchical Bayesian model to determine and predict corrosion defects in oil pipelines.

Awards and Leadership

- IEEE Signal Processing Society Young Author Best Paper Award
- Carnegie Institute of Technology Dean's Tuition Fellowship.
- Member, Honor Society Eta Kappa Nu