

# ROHAN A. VARMA

(510) 520-7049 • rohanv@andrew.cmu.edu • <https://www.rohanv.net>

## EDUCATION

**Carnegie Mellon University (2014 - 2019)** • Ph.D Electrical and Computer Engineering • M.Sc Electrical and Computer Engineering (2016)

**Relevant Coursework:** · Machine Learning and Statistical Learning Theory · Deep Learning and Neural Networks · Convex Optimization · Probabilistic Graphical Models · Probability Theory and Stochastic Processes · Multimedia Databases and Data Mining · Information Theory · 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 signal processing, machine learning and interdisciplinary work drawing from tools in statistics, information theory and optimization. Currently, I work in the general area of signal processing on graphs where I study the sampling and modeling of unstructured data that live on graphs advised by Prof. Jelena Kovačević.

## 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* arXiv:1905.12692. IEEE Transactions of Signal Processing.(submitted)
- **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 digital signal processing algorithms to enable accurate timing for GPS receiver on 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