

# ROHAN A. VARMA

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## EDUCATION

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

**Carnegie Mellon University (2014- 2020)** • Ph.D Electrical and Computer Engineering • M.S Electrical and Computer Engineering • M.S Computer Science (conc. Machine Learning) •

**Relevant Coursework:** · Machine Learning and Statistical Learning Theory · Deep Learning and Neural Networks · Convex Optimization · Probabilistic Graphical Models · Probability Theory and Stochastic Processes · Game Theory · Information Theory · Parallel Programming and Computer Architecture

## SKILLS

- Programming experience in Java, Python, C, C++, Julia, MATLAB, R, Haskell, JavaScript.
- Experience with the Hadoop, Hive, MapReduce, TensorFlow, 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., Chen, S., 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.(in submission)
- 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
- Varma, R., Chen, S., Singh, A. and Kovačević, J. (2018). *Signal Representations on Graphs: Tools and Applications*. arXiv:1512.05406.
- Mangia, M., Pareschi, F., Varma, R., Rovatti, R., Kovačević, J., Setti, G. (2018). *Rakeness-based Compressed Sensing of Multiple-Graph Signals for IoT Applications*. IEEE Transactions on Circuits and Systems II: Express Briefs.
- 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. (SPS Best Paper Award)

## 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 that employs greedy optimization-based algorithms

**Variational Inference for Gamma-Process Corrosion Models, CMU** (May 2016)

- Developed a variational inference based framework using a hierarchical Bayesian model to determine and predict corrosion defects in oil pipelines

## 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

**Undergraduate Researcher at Wireless Foundations, U.C. Berkeley** (July 2013 - May 2014)

- Extended an existing framework for low-rate sampling and efficient recovery of spectrally sparse signals (FFAST) with Prof. Kannan Ramchandran

**Undergraduate Researcher 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.