Sajjad Beygi (Beygiharchegani)

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Residency Status: US Permanent Resident
(Green card holder)

Area of Interests

Machine learning, Deep learning, Optimization algorithms, Digital signal processing, and Stochastic modeling

Work Experiences

- **Quantitative Researcher, Moody's Analytics**, New York, NY, May 2017 - present
  Developing and implementing (in Python/R) novel machine learning algorithms for tracking private firms' credit risk. Private firms' credit risk follows a non-stationary stochastic model. The non-stationary and time-varying nature of firms' credit risk is due to the rapid changes in the financial markets. My research work focus on developing algorithms to capture both dynamic and static evolutions of credit risk of firms using ensemble of statistical learning and deep learning algorithms.
- **Research Scientist (Intern), Nokia Bell Labs**, Murray Hill, NJ, Summer 2016
  Developing and implementing (in Python/Matlab) novel structured projection algorithms for high-resolution fMRI signal reconstruction from a small number of measurements. Our proposed algorithm take advantage of algorithms such as JP2K, H.264, etc. to learn the underlying model of compressible signal. Our algorithm requires less than 10% Fourier sampling of previous fMRI methods. Thus, it reduces the length of a typical fMRI process, from 1 hour to less than a minute.
- **Research Software Eng. (Intern), ZEFR Technology Inc.**, Los Angeles, CA, Summer 2015
  Developing and implementing (in Python/C++) machine learning and deep learning algorithms for a video matching problem over massive data sets. Our proposed method takes advantage of LSH, face detection, clustering, and deep learning to reduces the computational complexity of test process significantly. Data size: 20,000 movies/TV-shows $\approx$ 20 TB.

Education

Ph.D., University of Southern California, Los Angeles, CA
Ming Hsieh Department of Electrical Engineering, Viterbi School of Engineering 2012 - 2017
[-] Dissertation Title: Novel Optimization Tools for Structured Time-varying Signals Estimation

M.Sc., Sharif University of Technology, Tehran, Iran
Department of Electrical Engineering 2008 - 2010

B.Sc., Amirkabir University of Technology, Tehran, Iran
Department of Electrical Engineering 2004 - 2008

Selected Projects

- Credit Risk Analysis: SVM-Kernel via random feature mapping and SGD, and Boosted logistic regression
- Constraint Variable Selections (|variables| $\approx$1000): Exclusive LASSO, Nested LASSO, Sparse-Group LASSO
- Trade Data Clustering (data size 10GB): Spectral clustering, and Graph Clustering
- Credit Cycle Adjustment (time series data): State space modeling, HMM, EM Algorithm, and Kalman filtering
- Video indexing/matching (data size more than 20TB): Deep learning, LSH, K-mean, and Hierarchal clustering,

Selected Graduate Courses: Machine Learning, Analysis of Algorithms, Optimization Algorithms, Theory of Statistics, Stochastic Process, Stochastic Calculus, Applied Probability, Advanced digital signal processing, Wavelet Theory, Adaptive filtering, and Estimation and detection Theory

Selected Journal Papers (Check out my webpage for the list of full publications, citations:175)

1. S. Beygi, et.al, "Compressed Sensing of Compressible Signals," submitted to J. of Inf. and Inference, 2016.
2. S. Beygi, et.al, "Nested Sparse Approximation," IEEE Trans. on Signal Processing, 2015.
3. S. Beygi, et.al, "MSML Channel Estimation via Low Rank Approx.," IEEE Trans. on Signal Processing, 2015

Coding Skills: Python, R, C++, and Matlab

Fun facts about me: I love road-trips, hiking, trying new restaurants and foods, trading, and reading