

Dushyant Sahoo

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🌐 [Google Scholar](#) [in LinkedIn](#)

EDUCATION

2017 - Current **University of Pennsylvania, Philadelphia, PA, U.S.A.**

Ph.D. in Electrical and Systems Engineering, Adviser: Prof. Christos Davatzikos

A.M. in Statistics (Dual Degree)

Coursework: Principles of Deep Learning, Convex Optimization, Non-convex optimization, Mathematical Statistics, Advanced Linear Algebra, Mathematics in Data Science

2011 - 2016 **Indian Institute of Technology, Delhi, India**

M.Tech. in Information and Communication Technology, Adviser: Prof. Rahul Garg

B.Tech. in Electrical Engineering (Dual Degree)

367 rank in IIT-Joint Entrance Exam amongst 0.5 million candidates, KVPY Scholarship

PROJECTS

Aug'17 - **Robust Latent Hierarchical Factors in Human Brain**, *Ph.D. Thesis*

- Current
- Developed deep matrix factorization method to extract hierarchical low rank latent models
 - Solved problem using alternating minimization and adaptive gradient descent (AMSgrad)
 - Improved the generalizability of factors using adversarial learning in unsupervised regime

Aug'20 - **Early Stopping can Improve Langevin Dynamics Sampling**, *A.M. Thesis*

- Current
- Work motivated by implicit regularization of stochastic gradient flow for least squares
 - Developed computationally efficient method to sample from log-concave functions

Jan'19 - July'20 **AUC Maximization using SVRG**, *University of Pennsylvania*

- Introduced variance reduced version of stochastic gradient descent for AUC maximization
- Achieved linear convergence improving upon the sub linear rate of existing algorithms

Aug'16 - Feb'17 **Sparse Causality Patterns**, *Research Internship, University of Pennsylvania*

- Developed matrix factorization based causality analysis to estimate sparse causal links
- Solved the non-convex optimization problem using proximal alternating minimization
- Reduced run time from two days to 4 hours through CUDA based implementation

July'15 - **Consistent Patterns of Information flow in Human Brain**, *M.Tech Thesis*

- July'16
- Computed consistent causal links in human brain using Granger causality analysis
 - Modeled as Sparse Multivariate Autoregressive models and solved by regression

PUBLICATIONS

REFEREED CONFERENCES

- **D. Sahoo** and C. Davatzikos, “Learning Robust Hierarchical Patterns of Human Brain across Many fMRI Studies”, *Neural Information Processing Systems (NeurIPS) 2021*
- **D. Sahoo** and S. Dan “Variance Reduced Stochastic Proximal Algorithm for AUC Maximization”, *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD) 2021*
- **D. Sahoo**, N. Honnorat and C. Davatzikos, “Sparse low-dimensional causal modeling for the analysis of brain function”, oral presentation at *Medical Imaging: Image Processing (SPIE) 2019*
- **D. Sahoo**, N. Honnorat and C. Davatzikos, “GPU accelerated extraction of sparse Granger causality patterns” oral presentation at *International Symposium on Biomedical Imaging (ISBI) 2018*

- S. Ramachandhrula, M. Hambarde, A. Patial, **D. Sahoo** and S. Kochar, “Offline handwritten word recognition using MQDF-HMMs”, *Document Recognition and Retrieval (SPIE) 2015*
- N. Narendra, **D. Sahoo**, P. Reddy, A. Varghese, K. Kumar, M. Chandra and P. Balamuralidhar, “On using error correction for Mobile Augmented Reality applications”, *International Conference on Signal Processing, Communication and Networking (ICSCN) 2015*

JOURNALS

- **D. Sahoo** and C. Davatzikos, “Hierarchical extraction of functional connectivity components in human brain using resting-state fMRI”, *IEEE Transactions on Medical Imaging 2020*
- A. Saha, X. Yu, **D. Sahoo** and M. Mazurowski, “Effect of MRI scanner parameters on breast cancer radiomics and radiogenomics”, *Expert systems with applications 2017*

PREPRINTS

- **D. Sahoo**, A. Ali and E. Dobriban, “Early Stopping can Improve Langevin Dynamics Sampling”
- **D. Sahoo** and C. Davatzikos, “Extraction of Hierarchical Functional Connectivity Components in human brain using Adversarial Learning”

PROGRAMMING SKILLS & TOOLS

Skills Python, C++, Bash, CUDA, MATLAB, R, Java
 Tools scikit-learn, numpy, scipy, pandas, TensorFlow

TEACHING

Fall 2020 Principles of Deep Learning (University of Pennsylvania)
 Spring 2017 Machine Learning (University of Pennsylvania)
 Spring 2016 Advanced Functional Brain Imaging (IIT Delhi)
 Fall 2015 Compressive Sensing (IIT Delhi)