Arindam **Bose**

PhD Student · Signal Processing Researcher

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- I am currently a PhD student at the Department of Electrical and Computer Engineering, University of Illinois at Chicago. I work under Prof. Mojtaba Soltanalian at WaveOPT lab, UIC.
- I received my bachelor degree in Electronics and Communication Engineering from West Bengal University of Technology, India.

Research Interests

Statistical signal processing, optimization theory, machine learning, active sensing, and radar signal processing

Work Experiences

University of Illinois at Chicago

Chicago, USA

Research Assistant, WaveOPT lab, Department of Electrical and Computer Engineering — *Jul. 2016 - PRESENT*

- Developing convex and non-convex optimization algorithms for structured signal design
- Assisting and collaborating with Dr. M. Soltanalian in signal processing and optimization theory research and working towards PhD thesis

Teaching Assistant, Department of Electrical and Computer Engineering and Department of Physics — *Aug. 2015 - PRESENT*

- Courses assisted: Digital signal processing, Statistical signal processing, Image analysis and computer vision, Introductory physics, General physics
- Collaborated with several professors to setup exam questions and answers
- Graded papers, conducted lab sessions, and proctored examinations

Research Assistant, Machine Vision lab, Department of Electrical and Computer Engineering — *Jan. 2015 - Jun. 2016*

- Implemented and analysed multidimensional indexing algorithms for Human Activity Recognition (HAR) using Recognition based on Indexing and Sequencing (RISq) and produced significant increase in recognition efficieny than other algorithms such as DTW
- Assisted and collaborated with Dr. Jezekiel Ben-Arie in the research of optimization of various algorithms of Activity Recognition using Microsoft Kinect

KMB Telematics Inc.

Arlington, VA, USA

Summer Intern, Radar Signal Processing Team — *May 2019 - Aug. 2019*

- Conducted a radar literature review to understand what is the current state-of-the-art and what are the best current practices when it comes to high-resolution radar
- Simulated a radar system is the first step in understanding how the “real”, physical system is going to perform, when compared to the theoretical findings
- Developed sophisticated algorithms for antenna array designing for automotive MIMO radar

Mitsubishi Electric Research Laboratories

Cambridge, MA, USA

Summer Intern, Signal Processing Group — *May 2018 - Aug. 2018*

- Developed efficient algorithms for for Time-Domain Spectroscopy systems using THz

Cognizant Technology Solutions Pvt. Ltd.

Kolkata, India

Programmer Analyst, Health Care Practice — *Aug. 2014 - Apr. 2016*

- Developed and maintained several Java based web projects according to client requests
- Designed web services and complex web pages in JSP, HTML, CSS, and JavaScript
- Maintained PI and other health related client data in complex Oracle databases
- Developed and delivered special projects: Log Parser – a log management system for complex bug reports, PBMAid - an android app to track insurance related data for patients

Education

University of Illinois at Chicago

Chicago, USA

PhD in Electrical Engineering — *2016 - Expecting 2020*

- Thesis topic: Efficient design and analysis of structured signals (Advisor: Dr. Mojtaba Soltanalian)
- Current GPA 3.8/4.0

West Bengal University of Technology

Kolkata, India

B.Tech in Electronics and Communication Engineering — *2008 - 2012*

- Thesis topic: Efficient algorithms for digital watermarking (Advisor: Dr. Somnath Maiti)
- GPA 8.7/10.0

Publications

Journal Papers

One-Bit Radar Processing With Time-Varying Sampling Thresholds

A. Ameri, **A. Bose**, J. Li, and M. Soltanalian — *2019*

- Published in IEEE Transactions on Signal Processing
- Appeared on the IEEE TSP Popular Articles list

Constructing Binary Sequences With Good Correlation Properties: An Efficient Analytical-Computational Interplay

A. Bose, M. Soltanalian — *2018*

- Published in IEEE Transactions on Signal Processing

Conference Presentations

Deep One-Bit Compressive Autoencoder

Barcelona, Spain

S. Khobahi, **A. Bose**, and M. Soltanalian — *May 2020*

- Submitted in IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2020

Joint Optimization of Waveform Covariance Matrix and Antenna Selection for MIMO Radar

Pacific Grove, USA

A. Bose, S. Khobahi, and M. Soltanalian — *Nov. 2019*

- Presented in IEEE Asilomar Conference on Signals, Systems, and Computers 2019

Waveform Design for One-Bit Radar Systems Under Uncertain Interference Statistics

Pacific Grove, USA

A. Ameri, **A. Bose**, and M. Soltanalian — *Nov. 2019*

- Presented in IEEE Asilomar Conference on Signals, Systems, and Computers 2019

Learning-Based Shadow Mitigation for Terahertz Multi-Layer Imaging

Paris, France

P. Wang, T. Koike-Akino, **A. Bose**, R. Ma, P. Orlik, W. Tsujita, K. Sadamoto, H. Tsutada, and M. Soltanalian — *Sep. 2019*

- Presented in IEEE International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz) 2019

THz Multi-Layer Imaging Via Nonlinear Inverse Scattering

Paris, France

A. Bose, A. Kadu, H. Mansour, P. Wang, P. Boufounos, P. Orlik, and M. Soltanalian — *Sep. 2019*

- Presented in IEEE International Conference on Infrared, Millimeter, and Terahertz Waves (IRMMW-THz) 2019

Comprehensive Personalized Ranking Using One-Bit Comparison Data

Minneapolis, USA

A. Ameri, **A. Bose**, and M. Soltanalian — *Jun. 2019*

- Presented in IEEE Data Science Workshop (DSW) 2019

Design of Unimodular Sequence Sets with Good Correlation and Complementary Correlation Properties

Anaheim, USA

I. A. Arriaga-Trejo, **A. Bose**, A. G. Orozco-Lugo, and M. Soltanalian — *Nov. 2018*

- Presented in IEEE Global Conference on Signal and Information Processing (GlobalSIP) 2018

Generalized Cyclic Algorithms for Designing Unimodular Sequence Sets with Good (Complementary) Correlation Properties

Sheffield, UK

A. Bose, I. A. Arriaga-Trejo, A. G. Orozco-Lugo, and M. Soltanalian — *Jul. 2018*

- Presented in IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM) 2018

Low-Rank Matrix Recovery from One-Bit Comparison Information

Calgary, Canada

A. Bose, A. Ameri, M. Klug, M. Soltanalian — *Apr. 2018*

- Presented in IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2018

Designing Signals with Good Correlation and Distribution Properties

Calgary, Canada

A. Bose, N. Mohammadi, M. Soltanalian — *Apr. 2018*

- Presented in IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2018

Efficient Construction of Polyphase Sequences With Optimal Peak Sidelobe Level Growth

Montreal, Canada

A. Bose, M. Soltanalian — *Nov. 2017*

- Presented in IEEE Global Conference on Signal and Information Processing (GlobalSIP) 2017

Non-Convex Shredded Signal Reconstruction via Sparsity Enhancement

New Orleans, USA

A. Bose, M. Soltanalian — *Mar. 2017*

- Presented in IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2017

Enhanced Data Hiding Method Using DWT Based on Saliency Model *Solan, India*

C. Agarwal, **A. Bose**, S. Maiti, N. Islam, S. K. Sarkar *Sep. 2013*

- Presented in IEEE International Conference on Signal Processing, Computing and Control (ISPCC) 2013

Technical Documents

Robust Data Hiding Technique in Wavelet Domain Using Saliency Map

S. Maiti, C. Agarwal, **A. Bose**, S. K. Sarkar *2013*

- Published in International Journal of Advances in Engineering and Technology (IJAET), Volume 6, Issue 4, August – September 2013

An Improved Method of Pre–Filter Based Image Watermarking in DWT Domain

S. Maiti, **A. Bose**, C. Agarwal, S. K. Sarkar, N. Islam *2013*

- Published in International Journal of Computer Science and Technology (IJCST), Volume 4, Issue 1, January – March 2013

Face Detection and Tracking System

S. Sarkar, **A. Bose** *2012*

- Published in nternational Journal of Scientific and Engineering Research (IJSER), Volume 3, Issue 10, October – 2012.

Helianthus - a Low Cost High Efficient Solar Tracking System Using AVR Microcontroller

A. Bose, S. Sarkar, S. Das *2012*

- Published in International Journal of Scientific and Engineering Research (IJSER), Volume 3, Issue 10, October – 2012

Mathematical Time Domain Study of Negative Feedback System Using Limiting Progression

A. Bose *2012*

- Published in International Journal of Scientific and Engineering Research (IJSER), Volume 3, Issue 9, September – 2012

Book Chapter

Deep Learning Neural Networks Design and Case Studies

Author: Daniel Graupe *2016*

- Contribution: “Case study – Activity Recognition” appeared in chapter 8 and appendices
- Published by World Scientific Publishing Company, 2016

Teaching Experiences

Teaching Assistant, University of Illinois at Chicago

Digital Signal Processing I, Department of ECE *Spring 2017*
Digital Signal Processing II, Department of ECE *Fall 2016, 2017, 2018*
Statistical Signal Processing, Department of ECE *Spring 2018, 2019*
Image Analysis and Computer vision, Department of ECE *Fall 2015*
Introductory Physics, Department of Physics *Spring 2016*
General Physics, Department of Physics *Spring 2016*

Academic Services

2018-2019 **Conference Reviewer**, IEEE VTC 2018, EUSIPCO 2019
2018-2019 **Journal Reviewer**, IEEE Transaction of Signal Processing, Elsevier Signal Processing
Apr. 2019 **YP Chair Chicago Chapter**, IEEE Signal Processing Society *Chicago, USA*
Aug. 2016 **Vice President**, UIC ECE Journal Club *Chicago, USA*
2010-2011 **Chief Robotics Coordinator**, Future Institute of Engineering and Management *Kolkata, India*