Arindam **Bose**

PH.D. · **RADAR SIGNAL PROCESSING RESEARCHER**

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Summary

Currently working as a research engineer at KMB Telematics Inc. where we are making radar sensors for automotive cars. Finished Ph.D. in Electrical Engineering from the University of Illinois at Chicago under supervision of Prof. Mojtaba Soltanalian at WaveOPT lab. Research interests include FMCW radar, MIMO radar, radar signal processing, statistical signal processing, optimization theory, machine learning, active sensing. Always interested in devising a better problem-solving method for challenging tasks, and learning new technologies.

Work Experience

KMB Telematics Inc. *Arlington, VA, USA*

SENIOR RESEARCH ENGINEER, RADAR SIGNAL PROCESSING *Oct. 2020 - Present*

SENIOR RESEARCH INTERN, RADAR SIGNAL PROCESSING *May 2019 - Aug. 2020*

- Developing the digital design of a high performance automotive MIMO radar system using cutting edge FPGAs, MCUs and MPUs
- Implementing sophisticated algorithms for antenna array designing for automotive MIMO radar

University of Illinois at Chicago *Chicago, IL, USA*

RESEARCH ASSISTANT, WaveOPT LAB, DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING *May 2016 - Dec. 2020*

- Developed various non-convex optimization algorithms for waveform synthesis for active sensing systems
- Assisted and collaborated 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 - May 2020*

- Courses assisted: Digital signal processing, Statistical signal processing, Image analysis and computer vision, Introductory physics, General physics

Mitsubishi Electric Research Laboratories *Cambridge, MA, USA*

SUMMER INTERN, SIGNAL PROCESSING GROUP *May 2018 - Aug. 2018*

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

Cognizant Technology Solutions Pvt. Ltd. *Kolkata, India*

PROGRAMMER ANALYST, HEALTH CARE PRACTICE *Apr. 2013 - Jul. 2014*

- 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

Education

University of Illinois at Chicago *Chicago, IL, USA*

PHD IN ELECTRICAL ENGINEERING *2021*

MS IN ELECTRICAL ENGINEERING *2020*

- Thesis title: Waveform synthesis for active sensing with emerging applications (Advisor: Dr. Mojtaba Soltanalian)

West Bengal University of Technology *Kolkata, India*

B.TECH IN ELECTRONICS AND COMMUNICATION ENGINEERING *2012*

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

Publications

MAJOR JOURNAL PAPERS

Waveform Design for Mutual Interference Mitigation in Automotive Radar

A. BOSE, B. TANG, W. HUANG, M. SOLTANALIAN, AND J. LI *2022*

- arXiv preprint arXiv:2208.04398

Mutual Interference Mitigation for Multiple Connected Automotive Radar Systems

A. BOSE, B. TANG, M. SOLTANALIAN, AND J. LI *2021*

- Published in IEEE Transactions on Vehicular Technology, vol. 70, no. 10, Oct. 2021

Efficient Waveform Covariance Matrix Design and Antenna Selection for MIMO Radar

A. Bose, S. Khobahi, and M. Soltanalian

2020

- Published in Elsevier Journal of Signal Processing, vol. 183, Jun. 2021

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

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

A. Bose, M. Soltanalian

2018

- Published in IEEE Transactions on Signal Processing

Major Conference Presentations

Deep One-Bit Compressive Autoencoding

Rio de Janeiro, Brazil

S. Khobahi, A. Bose, and M. Soltanalian

Jul. 2021

- Presented in Statistical Signal Processing Workshop (SSP) 2021

Limits of Transmit Beamforming for Massive MIMO Radar

Pacific Grove, CA, USA

A. Bose, A. Ghauri, and M. Soltanalian

Nov. 2020

- Presented in IEEE Asilomar Conference on Signals, Systems, and Computers 2020

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

Pacific Grove, CA, USA

A. Bose, S. Khobahi, and M. Soltanalian

Nov. 2019

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

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, July 2018

Low-Rank Matrix Recovery from One-Bit Comparison Information

Calgary, Canada

A. Bose, A. Ameri, M. Klug, M. Soltanalian

Apr. 2018

- Presenting in 43rd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), April 2018

Designing Signals with Good Correlation and Distribution Properties

Calgary, AB, Canada

A. Bose, N. Mohammadi, M. Soltanalian

Apr. 2018

- Presenting in 43rd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), April 2018

Efficient Construction of Polyphase Sequences With Optimal Peak Sidelobe Level Growth

Montreal, QC, Canada

A. Bose, M. Soltanalian

Nov. 2017

- Presented in 5th IEEE Global Conference on Signal and Information Processing (GlobalSIP), Nov 2017

Non-Convex Shredded Signal Reconstruction via Sparsity Enhancement

New Orleans, USA

A. Bose, M. Soltanalian

Mar. 2017

- Presented in 42nd IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), March 2017

Patents

Learning-Based See-Through Sensing Suitable for Factory Automation

P. Wang, T.-K. Akino, P. Orlik, A. Bose

2019

- US Patent and Trademark Office, Patent ID: 20210064013, Appl. No.: 16/552116

Honors & Awards

2019	**Signal Processing Society Chicago Chapter Appreciation**, IEEE		*Chicago, IL, USA*
2014	**Associate of the Month**, Cognizant Technology Solutions		*Kolkata, India*
2011	**Winner**, The Telegraph Knowhow Innovation Hub, INFOCOM 10-11		*Kolkata, India*
2010-2013	**Special Prize**, Science and Engineering Fair		*Kolkata, India*
2008-2012	**Educational Scholarship**, Central Government of India		*Kolkata, India*