

Aveek Dutta

209 ETEC Building, Albany, NY 12222
adutta@albany.edu • +1 (518) 442-5083 • <https://www.albany.edu/faculty/adutta/>

RESEARCH INTERESTS	Deep Learning for Wireless Communications, Blockchain for Distributed Sensing, Interference Cancellation for Passive Spectrum Users, Architectures for Software Defined Radio
FACULTY APPOINTMENTS	University at Albany, State University of New York, Albany, New York, USA <ul style="list-style-type: none">Associate Professor, Department of Electrical and Computer Engineering Sep 2023 – Present<ul style="list-style-type: none">Co-Director: Mobile Emerging Systems and Applications (MESA) LabAssistant Professor, Department of Electrical and Computer Engineering Sep 2016 – Aug 2023 University of Kansas, Lawrence, Kansas, USA <ul style="list-style-type: none">Assistant Professor, Department of Electrical Engineering and Computer Science Sep 2015 – Jun 2016
POSTDOCTORAL EXPERIENCE	Princeton University, Princeton, New Jersey, USA May 2013 – Jun 2015 <ul style="list-style-type: none">Supervisor: Prof. Mung ChiangFocus: Crowdsourced enforcement of spectrum policies, Adaptive communication in Whitespaces and Hetnets.
EDUCATION	University of Colorado, Boulder, Colorado, USA May 2008 – May 2013 <ul style="list-style-type: none">Ph.D. in Electrical Engineering (Advisor: Prof. Dirk Grunwald)<ul style="list-style-type: none">Thesis: CODIPHY: Composing On-Demand Intelligent Physical LayersM.S. in Electrical Engineering Jan 2007 – May 2008<ul style="list-style-type: none">Thesis: An Intelligent Physical Layer for Cognitive Radio Networks Institute of Engineering and Management, Kolkata, India <ul style="list-style-type: none">B.S. in Electrical and Telecommunications Engineering May 1998 – May 2002<ul style="list-style-type: none">Graduated with College Honors
FELLOWSHIP	Air Force Research Lab, Rome, NY, USA <ul style="list-style-type: none">Visiting Summer Faculty Fellow Jun 2020 – Nov 2021Collaborator: Dr. Ngwe Thawdar<ul style="list-style-type: none">Topic: Channel prediction and precoding for non-stationary wireless channels
FUNDING	NSF Faculty Early Career Development (CAREER) – \$556,986.00 Jul 2022 – Jun 2027 Title – Generalizing Deep Learning for Wireless Communication PI: Dr. Aveek Dutta (University at Albany) Overview: The project expands the understanding and applicability of deep learning for practical wireless transceivers in four fundamental areas: Reliability, Generality, Complexity and Adaptability. This research takes a holistic approach by innovating adaptive algorithm for accurate spatio-temporal decomposition of the channel state and pre-condition the waveform for error free communications. The research is made practical by prototype hardware implementation of the transceiver architecture and validated with extensive over-the-air experimentation. NSF SWIFT – \$634,799.00 (UAlbany) + \$115,201.00 (Caltech) Oct 2022 – Sep 2025 Title – SCISRS: Signal Cancellation using Intelligent Surfaces for Radio Astronomy Services PI: Dr. Dola Saha (University at Albany) Co-PI: Dr. Aveek Dutta (University at Albany) and Dr. Greg Hellbourg (Caltech Astronomy) Overview: The primary technical objectives of this project are to accurately estimate the Radio Frequency Interference (RFI) that is incident at a Radio Telescope and configure the RIS so that the reflected signal precisely cancels the incident RFI at the Telescope. This is achieved by designing a a 16-channel high-speed FPGA platform along with a custom fabricated RIS to enable real time RFI estimation and adaptive beamforming. The project will construct an experimental radio telescope at UAlbany based on the Small Radio Telescope (SRT) design from MIT Haystack Observatory, which will be used to benchmark the RFI cancellation apparatus as well.

NSF SWIFT – \$635,901.00 (UAlbany) + \$124,508.00 (Caltech)

Oct 2021 – Sep 2024

Title – Interference Cancellation for Radio Astronomy

PI: **Dr. Aavek Dutta** (University at Albany)

Co-PI: Dr. Dola Saha (University at Albany) and Dr. Greg Hellbourg (Caltech Astronomy)

Overview: This project seeks to enhance coexistence in shared frequency bands between wireless cellular networks and passive radio telescopes. The approach focuses on active interference cancellation at the telescope supported by active bidirectional collaboration between the telescope and neighboring cellular networks. The research will be validated with a prototype deployment of the interference measurement and cancellation apparatus at the Deep Synoptic Array telescope (DSA-110) at the Owens Valley Radio Observatory.

NSF CISE Research Infrastructure Award (CRII) - \$749,999

Oct 2018 – Sep 2023

Title – CHRONOS: A Cloud based Hybrid RF-Optical Network Over Synchronous Links

PI: Dr. Dola Saha (University at Albany)

Co-PI: **Dr. Aavek Dutta** and Dr. Hany Elgala (University at Albany)

Overview: The primary goal of this project is to design, build and maintain a multi-node, heterogeneous, wideband, scalable, hybrid and synchronous Cloud Radio Access Network (Cloud RAN), specifically to support high throughput wireless access for emerging applications like Virtual Reality (VR), Industrial Internet of Things (IoT), 3D broadcast video, tele-surgery, etc. The combination of tight synchrony and heterogeneity among the network constituents make CHRONOS radically different and foundational to investigate previously unexplored research problems in wireless networking and communication. More Details can be found in the [CHRONOS Website](#).

HONORS & AWARDS

Junior Faculty Recognition, Office of Research and Economic Development, University at Albany for NSF-CAREER Award, April 2022.

Inventor Recognition, University at Albany, 2022.

Best Technical Paper in IEEE ICC 2021.

Best Technical Paper in IEEE DySPAN 2020.

Best Technical Paper in IEEE COMSNETS 2019.

TEACHING

Graduate Courses:

ECE 572: Advanced Digital Communications (First Offering) – S’18, S’20, S’21.

ECE 571: Probability and Random Processes (First Offering) – F’19.

ECE 660: Internet of Things – F’16, F’17.

Undergraduate Courses:

ECE 471: Communication Systems – F’20, S’22, S’23, S’24

ECE 371: Signals and Systems – S’21 (co-Instructor), F’21, F’22, F’23

ECE 416: Computer Communication Networks – F’18

CEN 140: Introduction to Engineering (discontinued) – S’17

Teaching at University of Kansas

Internet of Things (G/UG) (First Offering) – S’16.

Computer Networking (UG) – F’15.

PROFESSIONAL AFFILIATIONS & ACTIVITIES

Member: Institute of Electrical and Electronics Engineers, IEEE Communication Society, Association of Computing Machinery.

NSF Panel reviewer: 2018–Present (8 panels across the NSF CISE Directorate).

Session Chair: IEEE DySPAN 2019, IEEE INFOCOM 2024

Technical Program Committee: ACM MOBIHOC 2021

Journal Reviewer: IEEE Transaction of Communication, IEEE Transaction of Wireless Communication, IEEE Transaction of Information Forensics, IEEE Transaction of Networking, IEEE Transaction of Cognitive Communications and Networks, ACM Transaction of Mobile Computing

PUBLICATIONS**JOURNALS**

- [9] X. Wei, D. Saha, G. Hellbourg, A. Dutta, "IDOL: Iterative Direction Of Arrival in Low SNR", in *IEEE Transactions on Cognitive Communications and Networking* - Under Review.
- [8] Z. Zou, A. Dutta, "Multi-dimensional Eigenwave Multiplexing (MEM): A General Modulation Beyond OTFS", in *IEEE Transactions on Communications* - Under Review.
- [7] S. Chakraborty, G. Hellbourg, M. Careem, D. Saha and A. Dutta, "Collaboration With Cellular Networks for RFI Cancellation at Radio Telescope," in *IEEE Transactions on Cognitive Communications and Networking*, vol. 9, no. 3, pp. 765-778, June 2023.
- [6] Z. Zou, M. Careem, A. Dutta and N. Thawdar, "Joint Spatio-Temporal Precoding for Practical Non-Stationary Wireless Channels," in *IEEE Transactions on Communications*, vol. 71, no. 4, pp. 2396-2409, April 2023.
- [5] M. A. Abdul Careem, J. Gomez, D. Saha and A. Dutta, "RFEye in the Sky", in *IEEE Transactions on Mobile Computing*, vol. 21, no. 7, pp. 2566-2580, 1 July 2022.
- [4] M. A. Abdul Careem and A. Dutta, "Real-time Prediction of Non-stationary Wireless Channels", in *IEEE Transactions on Wireless Communications*, vol. 19, no. 12, pp. 7836-7850, Dec. 2020.
- [3] M. A. Abdul Careem, A. Dutta, "Spectrum Enforcement and Localization using Autonomous Agents with Cardinality", in *IEEE Transactions on Cognitive Communications and Networking*, vol. 5, no. 3, pp. 702-715, Sept. 2019..
- [2] A. Dutta and M. Chiang, "See Something, Say Something Crowdsourced Enforcement of Spectrum Policies", in *IEEE Transactions on Wireless Communications*, vol. 15, no. 1, pp. 67-80, Jan 2016.
- [1] D. Saha, A. Dutta, D. Grunwald and D. Sicker, "GRaTIS: Free Bits in the Network", in *IEEE Transactions on Mobile Computing*, vol. 14, no. 1, pp. 72-85, Jan 2015.

CONFERENCES

- [33] Z. Zou and A. Dutta, "Learning to Decompose Asymmetric Channel Kernels for Generalized Eigenwave Multiplexing," in *IEEE Conference on Computer Communications (INFOCOM)*, Vancouver, Canada, 2024
- [32] T. Asgari and A. Dutta, "Architecture and Benchmark of an Experimental CRAN Platform over CPRI," in *IEEE Conference on Computer Communications (INFOCOM)*, Vancouver, Canada, 2024
- [32] S. Chakraborty, D. Saha, A. Dutta and G. Hellbourg, "Low Overhead Multi-Source RFI Cancellation," in *2024 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, Washington DC, USA, 2024
- [30] X. Wei, A. Gupta, A. Dutta, D. Saha and G. Hellbourg, "RIS for Signal Cancellation in 3D," in *2024 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, Washington DC, USA, 2024
- [29] S. Munira, D. Saha, G. Hellbourg and A. Dutta, "Dynamic Protection Zone for Radio Astronomy," in *2024 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, Washington DC, USA, 2024
- [28] Z. Zou and A. Dutta, "Capacity Achieving by Diagonal Permutation for MU-MIMO Channels," in *GLOBECOM 2023 - IEEE Global Communications Conference*, Kuala Lumpur, Malaysia, 2023
- [27] Z. Zou and A. Dutta, "Multidimensional Eigenwave Multiplexing Modulation for Non-Stationary Channels," in *GLOBECOM 2023 - IEEE Global Communications Conference*, Kuala Lumpur, Malaysia, 2023
- [26] X. Wei, D. Saha, A. Dutta and G. Hellbourg, "Multistage 2D DoA Estimation in Low SNR", in *ICC 2023 - IEEE International Conference on Communications*, Rome, Italy, 2023.
- [25] S. Chakraborty, D. Saha, A. Dutta and G. Hellbourg, "LOCI: Learning Low Overhead Collaborative Interference Cancellation for Radio Astronomy", in *ICC 2023 - IEEE International Conference on Communications*, Rome, Italy, 2023.
- [24] Z. Zou, X. Wei, D. Saha, A. Dutta and G. Hellbourg, "SCISRS: Signal Cancellation using Intelligent Surfaces for Radio Astronomy Services", in *2022 IEEE Global Communications Conference*, Rio de Janeiro, Brazil, 2022.

- [23] M. A. Abdul Careem, Z. Zou, A. Dutta, N. Thawdar, “Unified Characterization and Precoding for Non-Stationary Channels”, in *ICC 2022 - IEEE International Conference on Communications*, Seoul, Korea, Republic of, 2022 [**Best Paper Award**].
- [22] S. Chakraborty, M. A. Abdul Careem, A. Dutta, D. Saha and G. Hellbourg, “Spectrum Sharing via Collaborative RFI Cancellation for Radio Astronomy” , in *RFI Conference*, 2022.
- [21] M. A. Abdul Careem, S. Chakraborty, A. Dutta, D. Saha, G. Hellbourg, “Spectrum Sharing via Collaborative RFI Cancellation for Radio Astronomy”, in *2021 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, Los Angeles, 2021 [**Best Paper Award**].
- [20] M. A. Abdul Careem, A. Dutta and N. Thawdar, “On Equivalence of Neural Network Receivers”, *ICC 2021 - IEEE International Conference on Communications*, 2021.
- [19] M. A. Abdul Careem, A. Dutta, ”Reputation Based Routing in MANET using Blockchain”, in *2020 12th IEEE International Conference on COMmunication Systems & NETworks (COMSNETS)*, Bangalore, 2020 [**Best Paper Award**].
- [18] M. A. Abdul Careem, A. Dutta, “SenseChain: Blockchain based Reputation System for Distributed Spectrum Enforcement”, in *2019 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, Newark, 2019.
- [17] M. A. Abdul Careem, A. Dutta and W. Wang, “Multi-Agent Planning with Cardinality: Towards Autonomous Enforcement of Spectrum Policies”, in *2018 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, Seoul, 2018.
- [16] M. A. Abdul Careem, A. Dutta, “Spatio-Temporal Recommender for V2X Channels”, in *2018 IEEE 88th Vehicular Technology Conference (VTC-Fall)*, Chicago, 2018.
- [15] M. A. Abdul Careem, M. Khadr, A. F. Hussien, D. Saha, H. Elgala and A. Dutta, “CHRONOS: A Cloud based Hybrid RF-Optical Network Over Synchronous Links,” in *2018 IEEE 5G World Forum (5GWF)*, Silicon Valley, CA, 2018.
- [14] M. Al-Ibadi and A. Dutta, “Predictive analytics for non-stationary V2I channel”, in *2017 9th International Conference on Communication Systems and Networks (COMSNETS)*, 2017.
- [13] M. Wang, A. Dutta, S. Buccapatnam and M. Chiang, “Regret-Minimizing Exploration in HetNets with mmWave”, in *2016 13th Annual IEEE International Conference on Sensing, Communication, and Networking (SECON)*, London, 2016.
- [12] X. Wang, J. Chen, A. Dutta and M. Chiang, “Adaptive video streaming over whitespace: SVC for 3-Tiered spectrum sharing”, in *2015 IEEE Conference on Computer Communications (INFOCOM)*, Kowloon, 2015.
- [11] A. Dutta, D. Saha, D. Grunwald, and D. Sicker., “CODIPHY – Composing On-Demand Intelligent Physical Layers”, in *2013 IEEE Proceedings of the second workshop on Software Radio Implementation Forum (SRIF)*, Hong Kong, 2013.
- [10] A. Dutta, D. Saha, D. Grunwald and D. Sicker, “Secret Agent Radio: Covert Communication through Dirty Constellations”, in *2013 Information Hiding (IH 2012), Lecture Notes in Computer Science*, vol 7692, 2013.
- [9] D. Saha, A. Dutta, D. Grunwald and D. Sicker, “GRaTIS: Sensing and intelligence for performance in the presence of legacy networks”, in *2012 7th International ICST Conference on Cognitive Radio Oriented Wireless Networks and Communications (CROWNCOM)*, Stockholm, 2012.
- [8] D. Saha, A. Dutta, D. Grunwald and D. Sicker, “Blind synchronization for NC-OFDM — When “channels” are conventions, not mandates”, in *2011 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, Aachen, 2011.
- [7] A. Dutta, D. Saha, D. Grunwald and D. Sicker, “An architecture for software defined cognitive radio”, in *Proceedings of the 6th ACM/IEEE Symposium on Architectures for Networking and Communications Systems (ANCS '10)*, La Jolla, 2010.
- [6] D. Saha, A. Dutta, D. Grunwald and D. Sicker, “Active radar — A cooperative approach using multicarrier communication”, in *IEEE Local Computer Network Conference*, Denver, 2010.
- [5] A. Dutta, D. Saha, D. Grunwald and D. Sicker, “Practical implementation of blind synchronization in NC-OFDM based cognitive radio networks”, in *Proceedings of the 2010 ACM workshop on Cognitive Radio Networks (CoRoNet)*, Chicago, 2010.

- [4] D. Saha, A. Dutta, D. Grunwald and D. Sicker, "Channel Assignment in Virtual Cut-through Switching Based Wireless Mesh Networks", in *Distributed Computing and Networking (ICDCN), Lecture Notes in Computer Science*, vol 5935, 2010.
- [3] A. Dutta, D. Saha, D. Grunwald and D. Sicker, "SMACK: a SMart ACKnowledgment scheme for broadcast messages in wireless networks", in *Proceedings of the ACM SIGCOMM 2009 conference on Data communication (SIGCOMM)*., Barcelona, 2009.
- [2] D. Saha, A. Dutta, D. Grunwald and D. Sicker, "'PHY Aided MAC - A New Paradigm", in *2015 IEEE Conference on Computer Communications (INFOCOM), Rio de Janeiro*, 2009.
- [1] A. Dutta, J. Fifield, G. Schelle, D. Grunwald and D. Sicker, "An intelligent physical layer for cognitive radio networks", in *Proceedings of the 4th Annual International Conference on Wireless Internet (WICON)*, Hawaii, 2008.

PATENT

"Wireless Signals Transmitter Parameter Estimation"

Filed U.S. Application No.: 17/659,440. SUNY Research Foundation is marketing for licensing this invention – [News Release](#).

**CAMPUS
ACTIVITIES**

Department of ECE

Chair

ECE-AI Faculty Search Committee (2024), CNSE-AI College-wide Faculty Search Committee (2023), Professor of Practice Search Committee (2020, 2022)

Graduate Admissions Committee (2023 - present), Undergraduate Curriculum Chair (2017-2020), ABET Accreditation Committee (2017-2019)

Member:

Graduate Admissions Committee (2018 - 2023), Graduate Curriculum Committee (2021 - present), ABET Accreditation Committee (2021 - present)

**CURRENT
STUDENTS**

Doctoral Candidates

- Maqsood Ahmed Abdul Careem (ECE) Graduated May 2023
 - Thesis Title: Trusted and Explainable Wireless Networks.
- Zhibin Zhou (ECE) Expected May 2025
 - Thesis Focus: Deep learning for non-stationary channels
- Tayyebah Asgari (ECE) Expected May 2025
 - Thesis Focus: Hybrid baseband processing for Cloud Radio Access Networks
- Anushka Gupta (ECE) Expected May 2026
 - Thesis Focus: Reconfigurable Surfaces for radio astronomy
- Iresha Amarasekara (ECE) Expected May 2027
 - Thesis Focus: Neuromorphic computing for ML based radio

**OTHER WORK
EXPERIENCE**

Research Assistant

Systems Lab, University of Colorado Boulder, CO

Jan 2007 – May 2013

Visiting Scholar

Wireless Information Network Laboratory (WINLAB), Rutgers University, NJ

May 2009 – Aug 2009

Research Intern

Mitsubishi Electric Research Laboratory, Boston, MA

Sep 2008 – Dec 2008

Assistant Manager - Projects

Tractors India Limited (Caterpillar India), Kolkata, India

May 2002 – May 2006

PRESENTATIONS

IEEE DySPAN, Seoul, 2018 – "Multi-Agent Planning with Cardinality: Towards Autonomous Enforcement of Spectrum Policies".

IEEE COMSNETS, Bangalore, 2020 – "Reputation Based Routing in MANET using Blockchain".

Air Force Research Laboratories, Rome, NY 2020 – "Spatio-Temporal Recommender for V2X Channels".

Air Force Research Laboratories, Rome, NY 2021 – "On Equivalence of Neural Network Receivers".