

• Wireless Communication • RF & Antenna Engineering • Information Theory • Machine Learning

Professional Summary: Third-year PhD student specializing in Integrated Sensing and Communication, and FR3 wireless communications with knowledge on 5G and RF system design. Research experience in MIMO, beamforming algorithm development, antenna design, and information-theoretic analysis. Skilled in MATLAB and Python with hands-on Machine Learning and RF lab experience.

EDUCATION

PhD in Electrical Engineering, University of Illinois Chicago (UIC) **2023 — ongoing**

Relevant Coursework: Digital Communications, Information Theory, Statistical Signal Processing, Random Signal Analysis, Convex Optimization, Antenna Engineering, Wireless Communications, Advanced Microwave Engineering, Neural Networks

BSc in Electrical and Electronic Engineering, Bangladesh University of Engineering and Technology (BUET) **2017 — 2022**

RESEARCH EXPERIENCE

Integrated Sensing and Communication **Aug 2023 — Present**

- Investigating Information and Estimation-theoretic bounds and trade-offs for practical ISAC scenarios.
- Developing hybrid beamforming and beamspace processing techniques to jointly optimize sensing and communication

Wireless Communication

- Investigating FR3 (7-24GHz) region for 6G Multiband mixed domain system design with reconfigurable antenna system
- Studying joint transmit-receive algorithm design for secure communication under jamming and hardware impairments

Applied Deep Learning **Jan 2021 — May 2023**

- Built deep learning models for medical (polyp) and biometric (fingerprint) image synthesis and analysis

PUBLICATIONS

7. **A. Sams**, Y. Cheng, M. Talha, B. Smida, A. Sabharwal, "Optimizing ISAC MIMO Systems with Reconfigurable Pixel Antennas," **Asilomar Conference on Signals, Systems, and Computers**, 2025.
6. **A. Sams**, S. Di Bari, B. Smida, N. Devroye, D. Tuninetti, G. Taricco, "On Estimation of Angles of Arrival in Monostatic ISAC Without Instantaneous Transmit CSI at the Transmitter," **Allerton Conference on Communication, Control, and Computing**, 2025
5. **A. Sams**, B. Smida, "On the Reliability of Estimation Bounds in Low-SNR Bistatic ISAC," **IEEE GLOBECOM**, 2025
4. **A. Sams**, A. H. Akash, S. M. Rahman, "SignBD-Word: Bangla Word-level Video-based Sign Language and Pose Translation," **IEEE ICCNT**, 2023
3. **A. Sams**, H. H. Shomee, S. M. Rahman, "HQ-finGAN: High-quality synthetic fingerprint generation using GANs," **Circuits, Systems, and Signal Processing**, 2022 [Journal](#)
2. **A. Sams**, H. H. Shomee, "GAN-based realistic gastrointestinal polyp image synthesis," **IEEE ISBI**, 2022
1. H. H. Shomee, **A. Sams**, "License plate detection and recognition system for all types of Bangladeshi vehicles," **IEEE DICTA**, 2021

ONGOING RESEARCH WORKS

- 'Multi-Target Sensing in Broadcast ISAC Without Instantaneous Transmit CSI' [With: S. Di Bari, B. Smida, N. Devroye, D. Tuninetti, G. Taricco] [Information Theory](#) [Estimation Theory](#)
- Mixed-domain FR3 Wireless Design with Reconfigurable Antennas for FR3-band Systems [With: Rice University, Aalto University] [Antenna Design](#) [RF Systems](#) [Signal Processing](#)
- Underlay Signal Transmission under Severe Interference and Jamming [With: B. Smida] [Signal Processing](#) [Deep Learning](#)

TECHNICAL SKILLS

Simulation & Programming: MATLAB, Python (NumPy, PyTorch), ANSYS HFSS, C, Arduino

Lab Equipment: Spectrum Analyzers, Oscilloscopes, VNAs, Signal Generators

Specialization: MIMO, Beamforming, ISAC, 5G/6G, FR3 Band, Reconfigurable Antennas

KEY RF & WIRELESS PROJECTS

Reconfigurable Pixel Antenna Design (ANSYS HFSS, MATLAB): Designed frequency, pattern, and reflection reconfigurable antenna for ISAC; performed full-wave EM simulation

Multiband Quasi Yagi-Type Antenna (ANSYS HFSS): Designed directional antenna with optimized gain and bandwidth; conducted S-parameter analysis and radiation pattern characterization

Acoustic Echo Cancellation (MATLAB): Implemented LMS/RLS adaptive filtering algorithms with convergence analysis; techniques applicable to RF beamforming

Channel Estimation with One-Bit ADCs (Python): Developed GAN-based approach for channel estimation under hardware constraints; investigated low-resolution ADC effects on RF systems

IoT Weather Station (Arduino, STM32): Hardware implementation with wireless sensor data transmission;

CONFERENCE PRESENTATIONS

- **IEEE Globecom 2025:** Presented our paper “*On the Reliability of Estimation Bounds in Low-SNR Bistatic ISAC.*” at Taipei, Taiwan.
- **Asilomar Conference on Signals, Systems, and Computers 2025:** Presented ongoing work on reconfigurable pixel antenna architectures for Integrated Sensing and Communication.
- **Asilomar Conference on Signals, Systems, and Computers 2024:** Presented our ongoing research on estimation bounds for Integrated Sensing and Communication.
- **IEEE ICCNT 2021, IEEE ISBI 2022, IEEE DICTA 2022:** Delivered presentations virtually.

TEACHING EXPERIENCE

Teaching Assistant

University of Illinois Chicago

Aug 2023 — Dec 2025

Chicago, IL

- Assisted in lectures, grading, and lab sessions for ‘Communication Engineering’ course (Dr. Besma Smida, Dr. Natasha Devroye)
- Conducted RF lab demonstrations using spectrum analyzers, oscilloscopes, and signal generators; created instructional videos for RF measurement techniques and MATLAB-based communication system simulations

Lecturer

Brac University & Bangladesh University of Textiles

Oct 2022 — May 2023

Dhaka, Bangladesh

- Taught Electrical Engineering fundamentals: Circuits, Electronic Devices, Digital Electronics, and Pulse Techniques
- Led lectures, laboratory sessions emphasizing practical circuit analysis and measurements, and assessments for large undergraduate classes

AWARDS & VOLUNTEERING SERVICE

- **UIC Graduate Student Council Travel Award** (Nov 2025), **IEEE Globecom 2025 Travel Grant (NSF)** (Nov 2025)
- **Vice Chair:** IEEE ComSoc Student Branch Chapter, UIC ('25-'26); **President:** Bangladeshi Students Association (BSA@UIC)
- **AI for Bangla 2.0:** Finalist (2023); **Analytical Olympiad:** Second Runner-up (2021)
- **Bangladesh Math Olympiad:** National Winner ('08, '11); Divisional Winner ('08, '10-'11, '13-'15)
- **Board Scholarships:** HSC, SSC, JSC Talent Pool Scholarships (Chittagong Board, 2012-2016)

SERVICES

Reviewer: IEEE SMC '21, IEEE ICECET '24-'25, IEEE ISWTA '24, IEEE ISCI '24, IEEE PowerAfrica '24, IEEE GLOBECOM '25, ASILOMAR '25, IEEE Trans. on Green Comm. and Networking, ICC '26 **TPC Reviewer:** IEEE MEDITCOM '24-'25

MENTORSHIP EXPERIENCE

10 Minute School: Created SmartBooks for high school students, transforming textbook content into multimedia formats

Chittagong Math Circle: Mentor delivering mathematics lectures for math enthusiasts