ATAHER SAMS

PhD Student, ◇ University of Illinois Chicago

Portfolio ◇ LinkedIn ◇ Google Scholar

SUMMARY

Fourth-year Ph.D. student in wireless communication and sensing for 5G/6G, working on ISAC theory, direction-of-arrival estimation algorithms, and analysis of reconfigurable antennas. Currently a visiting researcher at Rice University, working on multi-band radar fusion problem. Skilled in MATLAB and Python, with hands-on experience in machine learning and RF experimentation.

EDUCATION

PhD, Electrical & Computer Engineering,
University of Illinois Chicago (UIC) 2023 – Ongoing
Advisor: Dr. Besma Smida

BSc, Electrical & Electronic Engineering,
Bangladesh University of Engineering and Technology (BUET) 2017 – 2022

RESEARCH EXPERIENCE

Multiband Radar Sensing Fusion Summer 2026
Visiting Student Researcher, Rice University *with A. Sabharwal, N. Garg*

- Fusing 24 GHz and 77 GHz mmWave radar returns to exploit the resolution–penetration trade-off between bands, improving angular resolution and non-line-of-sight detection beyond what either band achieves alone.

Fundamental Limits of Integrated Sensing and Communication (ISAC) Aug 2023 – Present
Graduate Research Assistant, UIC *with B. Smida, N. Devroye, D. Tuninetti (UIC), G. Taricco (PoliTo)*

- Characterized achievable rate–sensing trade-off regions for broadcast ISAC under statistical-only transmit CSI via a joint ergodic-rate/Bayesian Cramér–Rao framework. Analyzed Ziv–Zakai bound for bistatic ISAC for sensing that remain tight in the low-SNR threshold region.

FR3 Multi-Band Systems & Reconfigurable Antennas Jan 2025 – Present
Graduate Research Assistant, UIC *with B. Smida (UIC), A. Sabharwal (Rice), & R. Wichman (Aalto)*

- Co-designed pattern reconfigurable pixel antennas, jointly optimizing pixel states and MIMO precoding in HFSS and MATLAB to improve ISAC performance without additional front-ends. Designed algorithms for pixel antennas that increases sensing Degree-of-freedom beyond what classical arrays can ever achieve.

Sample-Efficient Direction-of-Arrival Estimation 2024 – Present
Graduate Research Assistant, UIC *with B. Smida (UIC)*

- Building DoA estimators grounded in signal-subspace geometry rather than data-hungry learning, recovering resolution in the low-SNR, few-snapshot regime where most methods fail.

PUBLICATIONS

- **A. Sams** and B. Smida, "On the reliability of estimation bounds in low-SNR bistatic ISAC," in *Proc. IEEE GLOBECOM*, Taipei, Taiwan, Dec. 2025.
- **A. Sams**, S. Di Bari, B. Smida, N. Devroye, D. Tuninetti, and G. Taricco, "On estimation of angles of arrival in monostatic ISAC without instantaneous transmit CSI," in *Proc. Allerton Conf.*, Urbana, IL, USA, Sep. 2025.
- **A. Sams**, Y.-C. Hsiao, M. Talha, B. Smida, and A. Sabharwal, "Optimizing ISAC MIMO systems with reconfigurable pixel antennas," in *Proc. Asilomar Conf.*, Pacific Grove, CA, USA, Oct. 2025.
- **A. Sams**, A. H. Akash, and S. M. M. Rahman, "SignBD-Word: Video-based Bangla word-level sign language and pose translation," in *Proc. IEEE ICCCNT*, Delhi, India, Jul. 2023.

- **A. Sams**, H. H. Shomee, and S. M. M. Rahman, "HQ-finGAN: High-quality synthetic fingerprint generation using GANs," *Circuits, Syst., Signal Process.*, vol. 41, no. 11, Nov. 2022.
- **A. Sams** and H. H. Shomee, "GAN-based realistic gastrointestinal polyp image synthesis," in *Proc. IEEE ISBI*, Kolkata, India, Mar. 2022.
- H. H. Shomee and **A. Sams**, "License plate detection and recognition system for all types of Bangladeshi vehicles using multi-step deep learning model," in *Proc. DICTA*, Gold Coast, Australia, Nov. 2021.

Submitted & In Preparation

- **A. Sams**, B. Smida, N. Devroye, D. Tuninetti, and G. Taricco, "Broadcast ISAC without instantaneous transmit CSI: An ergodic rate–BCRB framework," submitted to *IEEE Transactions on Wireless Communications*, 2026.
- **A. Sams**, B. Smida, N. Devroye, D. Tuninetti, and G. Taricco, "Sensing-assisted broadcast ISAC without instantaneous CSIT," submitted to *IEEE Information Theory Workshop*, 2026.
- **A. Sams** and B. Smida, "Increasing DoA estimation DoF with reconfigurable antenna arrays," submitted to *IEEE Journal on Selected Areas in Communications*.
- **A. Sams**, M. Talha, and B. Smida, "Sample-efficient direction-of-arrival estimation," in preparation.

TECHNICAL SKILLS

Languages & Tools	MATLAB, Python, ANSYS HFSS, LTspice, Arduino, Sionna
RF	VNAs, spectrum analyzers, signal generators, oscilloscopes, radar
Domains	ISAC, MIMO & beamforming, 5G/6G and FR3, Signal processing, Reconfigurable antennas, Deep learning

SELECTED PROJECTS

- **Underlay Transmission Under Severe Interference and Jamming** (MATLAB): Designing underlay signaling that stays decodable when the intended link sits well below strong interference and hostile jamming.
- **Reconfigurable Pixel Antenna Design** (ANSYS HFSS, MATLAB): Designed frequency-, pattern-, and reflection-reconfigurable antennas 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 and real-time monitoring.

TEACHING EXPERIENCE

Graduate Teaching Assistant – ECE 311, Communication Engineering — Fall 2023 – Spring 2026
University of Illinois Chicago (UIC) — *Chicago, IL*

- Ran labs, recitations, and grading across five semesters for Profs. Besma Smida and Natasha Devroye; recognized with the college's TA excellence award.
- Built RF measurement demonstrations and instructional videos for the course.

Lecturer — Oct 2022 – May 2023
Brac University & Bangladesh University of Textiles — *Dhaka, Bangladesh*

- Taught Circuits, Electronic Devices, Digital Electronics, and Pulse Techniques, including labs and assessment, to large undergraduate cohorts.

CONFERENCE TALKS

- **IEEE GLOBECOM 2025** (Taipei, Taiwan) — reliability of classical estimation bounds for bistatic ISAC in the low-SNR regime.
- **Asilomar Conference 2025** (Pacific Grove, CA) — reconfigurable pixel antennas for ISAC, and the sensing gain from pattern reconfigurability.
- **Asilomar Conference 2024** (Pacific Grove, CA) — fundamental estimation bounds for ISAC and the case for better low-SNR sensing metrics.

AWARDS & GRANTS

- **Research Support**, NSF awards 1900911 and 2427158 — ongoing
- **Chancellor's Student Service Award**, UIC — 2026
- **Graduate Student Award for Teaching Assistant Excellence**, College of Engineering, UIC — 2026
- **IEEE GLOBECOM Travel Grant** (NSF-funded), IEEE Communications Society — 2025
- **Graduate Student Council Travel Award**, UIC — 2025
- **Winner, Special Innovation Category**, AI for Bangla 2.0 — 2023
- **National 2nd Runner-Up**, Bangladesh Mathematical Olympiad — 2008, 2011
- **Regional Champion**, Bangladesh Mathematical Olympiad — 2008, 2010, 2014

SERVICE & LEADERSHIP

- **Vice Chair** ('25–'27), IEEE ComSoc Student Branch Chapter, UIC;
  President ('25–'26) and **VP Media** ('24–'25), Bangladeshi Students Association at UIC.
- **Reviewer**
  - *Journals:* IEEE Transactions on Wireless Communications; IEEE Transactions on Green Communications and Networking.
  - *Conferences:* IEEE ISIT, GLOBECOM, ICC, SMC; Asilomar; ICECET; ISWTA; ISCI.
  - *TPC Reviewer:* IEEE MEDITCOM.