TANVIR AHMED

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RESEARCH INTERESTS

Wireless Sensing Privacy & Security, AI/ML in Healthcare, Signal Processing (Audio/Image/Video)

EDUCATION

Cornell University — Ithaca, NY 14850, US
Ph.D. in Information Science (GPA: **4.129**/4.3) — Aug 2023 - Aug 2028 *(Expected)*

- Committee: Rajalakshmi Nandakumar (Chairperson), Deborah Estrin, and Noah Snavely.
- Digital Life Initiative (DLI) Doctoral Fellow, 2025-26 Cohort, Cornell Tech.

Bangladesh University of Engineering and Technology (BUET) — Dhaka, Bangladesh
M.Sc. in Electrical & Electronic Engineering (GPA: **3.83**/4.00) — Apr 2019 - Jul 2023

- Thesis: Image Super-Resolution Using Wavelet Residual Convolutional Neural Networks [open access online]. Committee: S. M. Mahbubur Rahman (Chairperson), Shaikh Anowarul Fattah, Mohammed Imamul Hassan Bhuiyan, Md. Hasanul Kabir, and Md. Aynal Haque.

Bangladesh University of Engineering and Technology (BUET) — Dhaka, Bangladesh
B.Sc. in Electrical & Electronic Engineering (GPA: **3.82**/4.00) — Feb 2015 - Apr 2019

- Thesis: Detection of Traffic Signs from Live-Stream Video Captured in Vehicles. Advisor: S. M. Mahbubur Rahman.

CURRENT RESEARCH PROJECTS

Contactless Sleep Study Using mmWave Radar — Aug 2024 - *Present*

- Using mmWave FMCW radar system against the gold-standard PSG, for contactless monitoring of heart rate, respiratory rate, eye movement, sleep stages, and sleep disorders.
  Faculty advisors: Rajalakshmi Nandakumar, Ana C. Krieger (Weill Cornell Medicine).

Responsible Wireless Sensing — Aug 2024 - *Present*

- Towards a general privacy framework for wireless sensing technologies (mmWave, Acoustic, Wi-Fi) to ensure freedom, security, and quality of life.
  Faculty advisors: Rajalakshmi Nandakumar, Thijs Roumen (Cornell Tech).

PUBLICATIONS[†]

[C4] VitalHide: Enabling Privacy-Aware Wireless Sensing of Vital Signs
[*]Gao, Y., [*]Ahmed, T., Chang, Z., Roumen, T. & Nandakumar, R. [open access online]

- In Proc. of the *26th International Workshop on Mobile Computing Systems and Applications*, February 26-27, 2025, California, USA. (ACM HotMobile'25)
- Acceptance rate: 40%.
- News: Poster presented at NYC Privacy Day at Google – Fall 2024. Featured in ACM Showcase on Kudos.

[C3] Feasibility of Radio Frequency Based Wireless Sensing of Lead Contamination in Soil
Gao, Y., Ahmed, T., Cheng, Z., Mohammed, M. & Nandakumar, R. [open access online]

[*]equal contribution. [†]Google Scholar: https://scholar.google.com/citations?user=YVYJl3QAAAAJ&hl=en

- In Proc. of the *21st International Conference on Embedded Wireless Systems and Networks*, December 10-13, 2024, Abu Dhabi, UAE. (EWSN'24)
- Acceptance rate: 22.86%.
- News: Best Paper Award, Cornell Chronicle, Phys.org, MSN, American Technion Society, KARMACTIVE.

[J1] Biomimicry in Nanotechnology: a Comprehensive Review
Himel, M. H., Sikder, B., Ahmed, T. & Choudhury, S. M. [open access online]

- In *Nanoscale Advances* 5, no. 3 (2023): 596-614.

[C2] COVID-19 Identification From Lung CT Scans in a Low-Resource Setting Using a Regularized 3D Convolutional Neural Network
Ahmed, T., Nakib, M., Haque, M. A., & Miah, M. M. M. [pre-print] | [IEEE Xplore library]

- In Proc. of the *12th International Conference on Electrical and Computer Engineering*, December 21-23, 2022, Dhaka, Bangladesh. (ICECE)

[C1] Epileptic Seizure Prediction Using Bandpass Filtering and Convolutional Neural Network
Mustaqeem, N., Rahman, T., Priyo, J. F. B. K., Parvez, M. Z., & Ahmed, T. [pre-print] | [Springer library]

- In Proc. of the *1st International Conference on Machine Intelligence and Emerging Technologies*, Spetember 23-25, Noakhali, Bangladesh. (MIET)

ACADEMIC SERVICE

As a Reviewer

- Reviewed paper submissions for ACM Designing Interactive System Conference, DIS 2025
- Reviewed case studies for ACM Conference on Human Factors in Computing Systems, CHI 2025

As a Topic Chair

- Coordinated the review process for assigned submissions, managed reviewer assignments, and rendered preliminary accept/reject decisions at IEEE Energy Conversion Congress and Expo, ECCE 2025

WORK EXPERIENCE

Cornell Tech 2 W Loop Rd, New York, NY 10044, US

- Ph.D. Student Researcher @ Wireless Sensing and Mobile Systems Lab Aug 2023 - *Present*
- Graduate Teaching Assistant Appointments: ECE 5260/ORIE 5735 Graph-Based Data Science for Networked Systems (Spring 25), CS/INFO 5304 Data Science in the Wild (Spring 24), INFO 5600 AI for Healthcare (Fall 23, 24).

Brac University Dhaka, Bangladesh

- Lecturer @ Department of Computer Science and Engineering Jan 2020 - Aug 2023
- Courses Instructed: CSE 460 VLSI Design, CSE 428 Image Processing, CSE 350 Digital Electronics and Pulse Techniques, CSE 251 Electronic Devices and Circuits, CSE 250 Circuits and Electronics.

SCHOOL PROJECTS

- Peer-to-peer computational resource sharing in networked edge devices [report]
- Impact of multi-avatar and camera perspective on self-presence in VR [report]
- Performance analysis of privacy-preserving logistic regression classifiers on the MNIST dataset [report] [code]

- Segmentation of ground-glass opacity from COVID-19-infected lung CT scans [report] [code]
- Sign-language digit classification with explainable AI [report] [code]
- Stage spotlight automation using deep learning and micro-controllers [code]
- Design, implementation & verification of 32-bit MIPS processor [code], 8×8 Booth-encoded multiplier [report]
- Real-time ECG monitoring and disease detection using Arduino, ECG chip, and WiFi module [report]

TECHNICAL SKILLS

Programming Languages:	Python, C, C++, Assembly, Verilog
Machine Learning Libraries:	TensorFlow, Keras, PyTorch, Scikit-learn, MLX
Circuit Design & Simulation:	PSpice, Proteus, Quartus, Cadence
Numerical Analysis:	MATLAB, Numpy, SciPy
Google Workspace:	Docs, Sheets, Slides, Colab
Writing & Presentation:	Microsoft Word, Microsoft PowerPoint, LaTeX
Millimeter wave:	mmWave Studio
USRP:	GNU Radio

HONORS & AWARDS

- **Digital Life Initiative** (DLI) Doctoral Fellow, Cornell Tech 2025-26
- **Student Travel Grant Recipient**, ACM HotMobile '25, California, USA 2025
- **Student Travel Grant Recipient**, EWSN'24, Abu Dhabi, UAE (unable to attend due to visa issues) 2024
- **Photo Contest Winner**, "Tech Innovation in Frame" category, Cornell Tech, USA 2023
- **Undergraduate Degree Awarded with Honors** (Cumulative GPA $\geq$ 3.75), BUET 2019
- **Dean's List Award** (Academic Year GPA $\geq$ 3.75), BUET 2015, 2016, 2018
- **University Merit Award**, BUET 2015, 2016, 2017, 2018
- **National Idea Competition**, Top 10, Ministry of Power, Energy & Mineral Resources, Bangladesh 2017
- **National Physics Olympiad**, 1^{st} position, St. Joseph Higher Secondary School, Dhaka, Bangladesh 2014
- **Bangladesh Physics Olympiad**, 7^{th} position, Dhaka Divisional, Bangladesh 2014