TANVIR AHMED

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RESEARCH INTERESTS

Privacy-Aware Wireless Health Sensing with mmWave/Acoustic/Wi-Fi, Natural Language Understanding of Wireless Signal Processing, AI/ML in Healthcare,

EDUCATION

Cornell University   Ithaca, NY 14850, US
Ph.D. in Information Science (GPA: **4.18**/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: Bangladeshi Traffic Signs Detection from Live-Stream Videos. 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]

- 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)

SERVICE

- Reviewer: ACM DIS 2025, ACM CHI 2025 (Case Studies), UbiComp/ISWC 2025 (Notes and Briefs)
- Topic Chair: IEEE ECCE 2025
- Student Volunteer: ACM HotMobile 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
Sleep Medicine:	Rem Logic

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**, 1st position, St. Joseph Higher Secondary School, Dhaka, Bangladesh	2014
· **Bangladesh Physics Olympiad**, 7th position, Dhaka Divisional, Bangladesh	2014