TANJID HASAN TONMOY

PhD Student focused on ML-driven Ubiquitous Computing and Adaptive Systems

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Education

PhD Student, Data Science *Sep 2022 – Present*
University of California San Diego
Halıcıoğlu Data Science Institute (HDSI) Research Focus: Machine Learning, Ubiquitous Computing, Sensing Systems, Adaptive Systems, Healthcare IoT. Advisor: Prof. Tauhidur Rahman

B.Sc., Computer Science and Engineering *Jan 2016 – Dec 2019*
University of Dhaka
Dhaka, Bangladesh

- CGPA: 3.83 / 4.00 (Top 5% of class)

Publications

1. **Tonmoy, T. H.**, Singh, K., Malladi, R., Hossain, F. A., Gupta, R. K., Tejada-Martinez, A., & Rahman, T. (2025). AeroSafe: Mobile Indoor Air Purification using Aerosol Residence Time Analysis and Robotic Cough Emulator Testbed. *Accepted at International Conference on Robotics and Automation (ICRA).* [Preprint/TBA]
2. Hossain, F. A., **Tonmoy, T. H.**, Nuvvula, S., Chapman, B. P., Gupta, R. K., Lover, A. A., Dinglasan, R. R., Carreiro, S. & Rahman, T. (2024). Syndromic surveillance of population-level COVID-19 burden with cough monitoring in a hospital emergency waiting room. *Frontiers in Public Health, 12*, 1279392. [DOI]
3. Hossain, F. A., **Tonmoy, T. H.**, Lover, A., Corey, G., Alam, M. A. U., & Rahman, T. (2024). Crowdotic: A Privacy-Preserving Hospital Waiting Room Crowd Density Estimation with Non-speech Audio. *Proceedings of the 25th International Workshop on Mobile Computing Systems and Applications (HotMobile)* (pp. 79-85). [DOI]
4. **Tonmoy, M. T. H.***, Mahmud, S.*, Rahman, A. M., Amin, M. A., & Ali, A. A. (2021). Hierarchical Self Attention Based Autoencoder for Open-Set Human Activity Recognition. *Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD).* Springer. (* Equal contribution). [Link/DOI]
5. Mahmud, S.*, **Tonmoy, M. T. H.***, Bhowmik, K., Rahman, A. M., Amin, M. A., Shoyaib, M., Khan, M. A. H., & Ali, A. A. (2020). Human Activity Recognition from Wearable Sensor Data Using Self-Attention. *European Conference on Artificial Intelligence (ECAI)*, IOS Press. [DOI] (* Equal contribution).
* Denotes equal contribution.

Research Experience

Leveraging machine learning and sensing technologies to build and analyze intelligent systems capable of understanding and interacting with complex environments, particularly in health and ubiquitous computing contexts.

Graduate Student Researcher *Jul 2023 – Present*
UC San Diego
Advisor: Prof. Tauhidur Rahman

- Designing and implementing ML models (PyTorch) for healthcare applications using multimodal sensor data (audio, environmental, physiological).
- Developing closed-loop systems integrating real-time sensing with adaptive interventions (e.g., robotic control).
- **Representative Projects:** AeroSafe (ICRA'25 - autonomous robotics, sensor fusion); Crowd Sensing (HotMobile'24, Frontiers'24 - privacy-preserving audio, health surveillance).

Research Associate   *Feb 2020 – Jun 2022*
Independent University Bangladesh

- Investigated attention models (TensorFlow/PyTorch) for HAR from wearables (Published ECAI'20, PAKDD'21).
- Developed computer vision algorithms (OpenCV) for automated rehabilitation exercise evaluation.
- *Held concurrently with roles at Therap (BD) Ltd.*

Industry Experience

Software Engineer / Assoc. Software Engineer, ML   *Feb 2020 – Jun 2022*
Therap (BD) Ltd.
Dhaka, Bangladesh

- Progressed from Associate to Software Engineer within the Machine Learning team.
- Developed & deployed deep learning models (TensorFlow, Keras) for computer vision in healthcare (pose, fall detection).
- Optimized model inference for edge AI deployment (NVIDIA Jetson, TensorRT), enabling real-time analysis.
- Built predictive models using IoT/wearable sensor data (Python, Pandas, Scikit-learn).
- Contributed to data collection platforms/dashboards (React, Flask) and designed REST APIs for ML service integration.
- Conducted EDA/visualization (Matplotlib, Seaborn) on usage data for product insights.

Teaching Experience

University of California San Diego

- Teaching Assistant: DSC 40B (Theoretical Foundations II, Fall 2024), DSC 291 (Mobile/UbiComp, Winter 2024)

Skills

Programming :	Python (Advanced), C/C++ (Proficient), Java (Proficient), Shell Scripting (Intermediate), R (Intermediate), Julia (Familiar), JavaScript (Familiar), Swift (Familiar)
ML / Data Science :	PyTorch (Advanced), TensorFlow/Keras (Proficient), Scikit-learn, Deep Learning (CNN, RNN/LSTM, Transformers, Attention), Computer Vision (OpenCV), HAR, Statistical Modeling, Pandas, NumPy, Matplotlib, Seaborn
UbiComp / IoT / Mobile :	Sensor Data Analysis, Wearable Technology, Closed-Loop Systems, Context-Aware Systems, Embedded Systems (NVIDIA Jetson, Raspberry Pi), ROS (Intermediate), Android/iOS (Basic)
Tools & Platforms :	Git, Docker, TensorRT, LaTeX, SQL, Firebase, Linux
Web Technologies :	React (Familiar), Flask (Familiar), HTML/CSS (Basic)