

School of Electrical Engineering and Computer Science,
Washington State University,
Pullman, WA, USA.

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RESEARCH INTERESTS

Trustworthy Machine Learning (TML), large language models (LLM) hallucination mitigation, Conformal Prediction, Deep Learning, Multi-target Regression with Representation Learning, Computer Vision, and Generative AI.

RESEARCH SUMMARY

My general research interests are in **Artificial Intelligence (AI)** and **Machine Learning (ML)**, with a main focus on developing robust, safe, and trustworthy ML algorithms and theoretical frameworks for addressing critical real-world challenges within safety-sensitive domains. My current work focuses on:

- Building trustworthy Large Language Model (LLM) hallucination control policies.
- Adapting calibration-based uncertainty quantification methods, like Conformal Prediction, to facilitate effective and secure human-ML collaboration.
- Developing uncertainty-aware energy management methods for wearable Internet of Things (IoT) devices.

EDUCATION

Ph.D., Computer Science Jul., 2022 – May, 2027
Washington State University
Advisors: Prof. Jana Doppa
Thesis: Developing Novel Algorithms and Theory for Robust and Trustworthy Machine Learning.
Pullman, WA, USA

M.Sc., Computer Science 🎓 Aug., 2022 – May, 2025
Washington State University
Thesis: Conformalized Uncertainty Regions for Machine Learning-Based Multiple Cognitive Health Measures from Smartwatch Sensor Data.
Pullman, WA, USA

B.Sc., Statistics 🎓 (First Class Honors) Sept., 2014 – Nov., 2018
University of Nigeria
Thesis: Sensitivity of Randomization test and F-test in Some Experimental Designs
Class rank: Best Graduating Student
Nsukka, Nigeria

PROFESSIONAL APPOINTMENTS

Research Assistant Aug 2022 – Present
EECS Department – Washington State University
– Developing Novel Algorithms and Theory for Robust and Trustworthy Machine Learning.
Pullman, WA, USA

Teaching Assistant and Guest Lecturer Aug 2022 – Dec 2024
EECS Department – Washington State University
– CptS 223: Advanced Data Structures C/C++ (Fall-2022)
– CptS 315: Introduction to Data Mining (Spring-2023)
– CptS 223: Advanced Data Structures C/C++ (Fall-2023)
– CptS 315: Introduction to Data Mining (Spring-2024)
– CptS 223: Advanced Data Structures C/C++ (Fall-2024)
Pullman, WA, USA

Assistant Lecturer 2019 – 2020
Statistics Department – Kano State Polytechnic
Kano, Nigeria

– Course: Introduction to Statistical Inference

AWARDS AND HONORS

🏆 Mahmoud M. Dillsi Graduate Fellowship	Oct., 2025
🏆 Nakahara Tsuyoshi and Mary Fellowship	Nov., 2024
🏆 Outstanding Graduate Teaching Assistant in EECS Award <i>Voiland College of Engineering, Washington State University</i>	Apr., 2024
🏆 EducationUSA Opportunity Fund Program (OFP) Scholar. <i>USA Embassy, Abuja, Nigeria</i>	Jun., 2022
🏆 Best Graduating Student <i>Statistics Department – University of Nigeria</i>	Nov., 2018
🏆 Winner: Nigerian Statistical Association (NSA) competition <i>Representative of the University of Nigeria.</i>	May, 2018
🏆 Gold medalist: NSA competition individual category <i>Representative of the University of Nigeria.</i>	May, 2018

PROJECTS/SOFTWARE

Adaptive Prediction Region (APR) [code] – Developed a novel framework (APR) for constructing trustworthy, adaptive uncertainty regions for multi-target regression tasks.	Aug., 2024
ML Adversary: Attack and Defense (Course Project) [code] – Designed and implemented a web-based application for dog breed classification, incorporating defenses against adversarial attacks to enhance model robustness and reliability.	Nov., 2023
Multi-target Conformal Prediction (MTCP) [code] – Designed software (MTCP) to predict calibrated joint regions from independent targets in multi-target regression tasks.	Nov., 2023

PUBLICATIONS

- [AAAI'26] Chibuiké E. Ugwu, Roschelle Fritz, Diane J. Cook, and Janardhan Doppa. **Clinician-in-the-Loop Smart Home System to Detect Urinary Tract Infection Flare-Ups via Uncertainty-Aware Decision Support.** *To appear in Proceedings of 40th AAAI Conference on Artificial Intelligence (AAAI) 2026. (Accepted)*
- [IJCAI'25] Chibuiké E. Ugwu*, Dina Hussein*, Ganapati Bhat, and Janardhan Doppa. **Sustainable Wearables for Health Applications and Beyond via Uncertainty-Aware Energy Management.** *Proceedings of the 34th International Joint Conference on Artificial Intelligence (IJCAI), 2025 (* denotes equal contribution)*
- [DAC'25] Chibuiké E. Ugwu*, Dina Hussein*, Ganapati Bhat, and Janardhan Doppa. **Uncertainty-Aware Energy Management for Wearable IoT Devices with Conformal Prediction.** *Proceedings of the 62nd ACM/IEEE Design Automation Conference (DAC), 2025. (* denotes equal contribution)*
- [TECS'25] Pratyush Dhingra, Chibuiké E. Ugwu, Janardhan Rao Doppa, and Partha Pratim Pande. **ERGo: Energy-Efficient Hybrid Graph Neural Network Training on Heterogeneous Processing-In-Memory Architecture.** *ACM Transactions on Embedded Computing Systems (TECS), 2025.*

- [QREI'23] Abimibola V. Oladugba, Chibuiké E. Ugwu, and Uchenna C. Onwuamaeze. **Sensitivity and robustness of randomization test and F-test in some experimental designs.** *Quality and Reliability Engineering International*, 39(7), 2967-2974, 2023.

PAPERS UNDER REVIEW

- [AISTATS'26] Hooman Shahrokhi, Chibuiké E. Ugwu, Yan Yan, and Janardhan Doppa. **Controlling Coverage for Batch Evaluation via Vanilla Conformal Prediction.** *Twenty-ninth International Conference on Artificial Intelligence and Statistics (AISTATS)* 2026.
- [TMLR'25] Chibuiké E. Ugwu, Yan Yan, Diane J. Cook, and Janardhan Doppa. **Uncertainty Regions for Multi-Target Regression via Input-Dependent Conformal Calibration.** *Transactions of Machine Learning Research (TMLR)*, 2025.
- [HEALTH'25] Chibuiké E. Ugwu, Yan Yan, Diane J. Cook, Maureen Schmitter-Edgecombe, and Janardhan Doppa. **Importance-Weighted Calibrated Region Prediction of Multi-target Cognitive Health Measures from Smartwatch Sensor Data.** *ACM Transactions on Computing for Healthcare*, 2025.
- [TODAES'25] Chibuiké E. Ugwu*, Dina Hussein*, Ganapati Bhat, and Janardhan Doppa. **Trading Off Performance and Sustainability in Internet of Things: An Uncertainty-Aware Hierarchical Energy Management Approach.** *ACM Transactions on Design Automation of Electronic Systems (TODAES)*, 2025. (* denotes equal contribution)

PROFESSIONAL SERVICES AND OUTREACH ACTIVITIES

PROGRAM COMMITTEE

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| 1. International Conference on Learning Representations (ICLR) | 2026 |
| 2. Association for the Advancement of Artificial Intelligence (AAAI) | 2026 |
| 3. AAAI Conference on Artificial Intelligence, AI for Social Impact Track (AISI) | 2026 |
| 4. AAAI Conference on Artificial Intelligence, AI for Innovative Applications (AISI) | 2026 |
| 5. International Conference of Machine Learning (ICML) | 2025 |
| 6. Association for the Advancement of Artificial Intelligence (AAAI) | 2025 |
| 7. AAAI Conference on Artificial Intelligence, AI for Social Impact Track (AISI) | 2025 |

TECHNICAL/PROFESSIONAL EVENTS

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|---|-------|
| 1. Volunteer for Association for the Advancement of Artificial Intelligence (AAAI) (<i>selected</i>), | 2026. |
| 2. Volunteer for International Joint Conference on Artificial Intelligence (IJCAI), | 2025. |
| 3. Mentor and Judge for Digital AgAthon (AgAID Institute), | 2025. |
| 4. Instructor for WSU Summer Programming Camp for Middle Schoolers, | 2025. |