Zikang Leng

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Education

Georgia Institute of Technology — Atlanta, GA
PhD in Computer Science — *Aug. 2024 - Present*

- Research Areas: Human Activity Recognition, Data Generation, Large Language Models (LLMs), Computer Vision
- Advised by Prof. Thomas Plötz

Georgia Institute of Technology — Atlanta, GA
B.S. in Computer Science (Theory & AI), B.S. in Physics | GPA: 4.0 — *Aug. 2021 - May. 2024*

- Advised by Prof. Thomas Plötz and Hyeokhyen Kwon

Experience

Graduate Research Assistant — Aug. 2024 - Present
Georgia Institute of Technology — *Atlanta, GA*

- Created AgentSense, a framework that uses LLM-guided agents in simulated smart homes to generate diverse, privacy-preserving ambient sensor data for Human Activity Recognition
- Developing a multimodal in-ear sensing framework to detect engagement in remote learning scenarios

Research Intern, Sensor Machine Learning — Jun. 2025 - Aug. 2025
Nokia Bell Labs — *Cambridge, United Kingdoms*

- Built a multimodal fusion framework that learns from ECG during training to enable accurate health sensing using only IMU and PPG at inference.
- Applied self-supervised clustering and uncertainty estimation to improve model robustness and interpretability.

Undergraduate Research Assistant — Aug. 2022 - May. 2024
Georgia Institute of Technology — *Atlanta, GA*

- Created IMUGPT, a system that can generate virtual IMU data from virtual textual descriptions of activities by combining large language models, motion synthesis, and signal processing method
- Designed and evaluated two data collection methods for wheelchair transportation mode detection without requiring direct participation from wheelchair users.
- Developed a personalized emotion recognition system using wearable IMUs and leveraging generated synthetic data
- Created FingerSpeller, an innovative text entry system that accurately recognizes American Sign Language fingerspelling words using smart rings

Machine Learning Research Intern - SULI (Advised by Dr. Xiaodong Yu) — May. 2023 - Aug. 2023
Argonne National Laboratory — *Lemont, IL*

- Accelerated the training of graph neural network (GNN) for ocean simulation 213 times using 256 GPU
- Augmented GNN training data by performing IDW interpolation on existing data, enabling training at a larger scale

Selected Publications

AgentSense: Virtual Sensor Data Generation Using LLM Agents in Simulated Home Environments — Accepted at AAAI '26 *[arxiv]*
Zikang Leng*, *Megha Thukral**, *Yaqi Liu**, *Hrudhai Rajasekhar, Shruthi K Hiremath, Jiaman He, Thomas Plötz*

IMUGPT 2.0: Language-Based Cross Modality Transfer for Sensor-Based Human Activity Recognition — IMWUT *[paper]*
Zikang Leng*, *Amitrajit Bhattacharjee, Hrudhai Rajasekhar, Lizhe Zhang, Elizabeth Bruda, Hyeokhyen Kwon, Thomas Plötz*

We Need More Data for People with Disabilities: A Comparative Study on Data Collection for Wheelchair Transportation Mode Detection (Best Paper Nomination) — UbiComp/ISWC '24 *[paper]*
*Sungjin Hwang**, ***Zikang Leng****, *Seungwoo Oh, Kwanguk Kim, Thomas Plötz*

Emotion Recognition on the Go: Utilizing Wearable IMUs for Personalized Emotion Recognition — UbiComp'24 HASCA *[paper]*
Zikang Leng*, *Myeongul Jung* Sungjin Hwang, Seungwoo Oh, Lizhe Zhang, Thomas Plötz, Kwanguk Kim*

*Both authors contributed equally to this work

FingerSpeller: Camera-Free Text Entry Using Smart Rings for American Sign Language Fingerspelling Recognition ASSETS '23 *[paper]*
David Martin, **Zikang Leng***, Tan Gemicioglu, Jon Womack, Jocelyn Heath, Bill Neubauer, Hyeokhyen Kwon, Thomas Plötz, Thad Starner*

Generating Virtual On-body Accelerometer Data from Virtual Textual Descriptions for Human Activity Recognition (Best Paper Honorable Mention) UbiComp/ISWC '23 *[paper] [code] [news]*
***Zikang Leng**, Hyeokhyen Kwon, Thomas Plötz*

On the Utility of Virtual On-body Acceleration Data for Fine-grained Human Activity Recognition UbiComp/ISWC '23 *[paper]*
***Zikang Leng**, Yash Jain, Hyeokhyen Kwon, Thomas Plötz*

On the Benefit of Generative Foundational Models for Human Activity Recognition GenAI4PC Symposium *[page][paper]*
***Zikang Leng**, Hyeokhyen Kwon, Thomas Plötz*

Patent

Language-based Cross-modality Transfer System for Generating Virtual Inertial Measurement Unit Data to Enhance Human Activity Recognition US Patent Filed

A System for Quality-Aware Multimodal Fusion Representation Learning with Uncertainty Estimation for Health Condition Modelling US Patent Filed

Awards

NSF Graduate Research Fellowship (GRFP) 2024
- Supports exceptional graduate students in STEM disciplines by providing a three-year stipend of $37,000 annually, plus a $16,000 yearly allowance for tuition and fees

Georgia Tech President's Fellowship 2024
- Awarded to a select group of highly qualified students pursuing doctoral degrees who bring exemplary levels of scholarship and innovation. $5,500 annual stipend, renewable for three years

Georgia Tech Institute Fellowship 2024
- Georgia Tech's most prestigious fellowship for graduate students, awarded to a select few President's Fellowship holders. $2000 annual stipend, renewable for three years

Provost's Academic Excellence Award 2024
- Recognized as the top graduating senior from Georgia Tech's College of Computing, receiving a $2,000 award

President's Undergraduate Research Awards (Salary and Travel) 2023
- Awarded $2,500 to conduct undergraduate research with Georgia Tech faculty and offset travel expenses

Relevant Courseworks

CS 4644: Deep Learning
CS 4641: Machine Learning
CS 4540: Advanced Algorithm
CS 4510: Automata and Complexity Theory
CS 3630: Introduction to Perception and Robotics
CS 3600: Introduction to Artificial Intelligence

Technical Skills

Languages: Python, Java/JavaFX, C/C++, LaTeX, UML, Bash
Developer Tools: Git, Docker, VS Code, IntelliJ, Eclipse
Libraries: PyTorch, OpenAI, OpenCV, scikit-learn, NumPy, Keras, TensorFlow

Mentored Students

Masters Students: Amitrajit Bhattacharjee, Yaqi Liu, Hrudhai Rajasekhar, Kalyan Salkar, Zijun Wang
Undergraduate Students: Elizabeth Bruda, Jocelyn Heath, Archith Iyer, William (Bill) C Neubauer, Ruijia Peng, Lizhe Zhang

References

Dr. Thomas Plötz Professor, School of Interactive Computing, Georgia Institute of Technology
Dr. Hyeokhyen Kwon Assistant Professor, Department of Biomedical Informatics, Emory University
Dr. Thad Starner Professor, School of Interactive Computing, Georgia Institute of Technology