

# Zikang Leng

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🏠 [zikangleng.github.io](https://github.com/zikangleng)

in [zikang-leng](https://www.linkedin.com/in/zikang-leng)

🐙 [ZikangLeng](https://github.com/ZikangLeng)

## EDUCATION

### Georgia Institute of Technology

*PhD in Computer Science*

Atlanta, GA

Aug. 2024 - Present

- Research Areas: Human Activity Recognition, Data Generation, Computer Vision
- Advised by Prof. Thomas Plötz

### Georgia Institute of Technology

*B.S. in Computer Science (Theory & AI), B.S. in Physics | GPA: 4.0*

Atlanta, GA

Aug. 2021 - May. 2024

- Advised by Prof. Thomas Plötz and Hyeokhyen Kwon

## EXPERIENCE

### Graduate Research Assistant

*Georgia Institute of Technology*

Aug. 2024 - Present

Atlanta, GA

- Developing a system to generate smart home sensor data using large language model and home simulator.
- Developing a phone-based system that uses ultrasound to detect breast tissue anomalies and monitor fetal heart rate

### Undergraduate Research Assistant

*Georgia Institute of Technology*

Aug. 2022 - May. 2024

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
- Developed a novel image segmentation model to segment foot ulcers in naturalistic foot images of patients of color
- 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, leveraging synthetic data to minimize the need for real-world data collection
- Created FingerSpeller, an innovative text entry system that accurately recognizes American Sign Language fingerspelling words using smart rings
- Introduced a novel method for measuring the subtlety of motion involved in activities in videos using optical flow and 2D pose estimation to evaluate the benefit of virtual IMU data for fine-grained Human Activity Recognition.

### Machine Learning Research Intern - SULI (Advised by Dr. Xiaodong Yu)

*Argonne National Laboratory*

May. 2023 - Aug. 2023

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
- Showcased findings in a poster presentation to the students and staff of Argonne National Laboratory

## PUBLICATIONS

### Recognizing Diabetic Foot Ulcers in Patients of Color by Automatically Analyzing Naturalistic Foot Images

Under Review

*Cynthia Baseman\*, Zikang Leng\*, Thomas Plötz, Gabriel Santamarina, Marcos C. Schechter, Maya Fayfman, Rosa I. Arriaga*

### 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

<b>FingerSpeller: Camera-Free Text Entry Using Smart Rings for American Sign Language Fingerspelling Recognition</b> <i>David Martin*, Zikang Leng*, Tan Gemicioglu, Jon Womack, Jocelyn Heath, Bill Neubauer, Hyeokhyen Kwon, Thomas Plötz, Thad Starner</i>	ASSETS '23 <a href="#">[paper]</a>
<b>Generating Virtual On-body Accelerometer Data from Virtual Textual Descriptions for Human Activity Recognition (Best Paper Honorable Mention)</b> <i>Zikang Leng, Hyeokhyen Kwon, Thomas Plötz</i>	UbiComp/ISWC '23 <a href="#">[paper]</a> <a href="#">[code]</a> <a href="#">[news]</a>
<b>On the Utility of Virtual On-body Acceleration Data for Fine-grained Human Activity Recognition</b> <i>Zikang Leng, Yash Jain, Hyeokhyen Kwon, Thomas Plötz</i>	UbiComp/ISWC '23 <a href="#">[paper]</a>
<b>On the Benefit of Generative Foundational Models for Human Activity Recognition</b> <i>Zikang Leng, Hyeokhyen Kwon, Thomas Plötz</i>	GenAI4PC Symposium <a href="#">[page]</a> <a href="#">[paper]</a>

## AWARDS

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<b>NSF Graduate Research Fellowship (GRFP)</b>	2024
<ul style="list-style-type: none"> <li>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</li> </ul>	
<b>Georgia Tech President's Fellowship</b>	2024
<ul style="list-style-type: none"> <li>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</li> </ul>	
<b>Georgia Tech Institute Fellowship</b>	2024
<ul style="list-style-type: none"> <li>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</li> </ul>	
<b>Provost's Academic Excellence Award</b>	2024
<ul style="list-style-type: none"> <li>Recognized as the top graduating senior from Georgia Tech's College of Computing, receiving a \$2,000 award</li> </ul>	
<b>Best Paper Honorable Mention ACM ISWC</b>	2023
<ul style="list-style-type: none"> <li>Awarded at Ubicomp/ISWC 2023 to recognize papers that stand out for demonstrating innovative research, significant contributions to the field, and high-quality writing</li> </ul>	
<b>President's Undergraduate Research Awards (Salary and Travel)</b>	2023
<ul style="list-style-type: none"> <li>Awarded \$2,500 to conduct undergraduate research with Georgia Tech faculty and offset travel expenses</li> </ul>	

## RELEVANT COURSEWORKS

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

## TECHNICAL SKILLS

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

## MENTORED STUDENTS

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

## REFERENCES

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