Zikang Leng

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Education

Georgia Institute of Technology Atlanta, GA

B.S. in Computer Science(Theory & AI), B.S. in Physics | GPA: 4.0 *Aug. 2021 - Exp. May. 2024*

- Courses: Intro to OOP, Data Structures, Computer Organiz & Program, Machine Learning, Intro to AI, Intro to Robotics, Algorithms Honors, Deep Learning, Automata & Complexity, Advanced Algorithm

Experience

Undergraduate Research Assistant (Advised by Dr. Thomas Plötz) Aug. 2022 - Present

Georgia Institute of Technology *Atlanta, GA*

- Working on diabetic foot ulcer image segmentation and 3d foot reconstruction from videos
- Created a system that can generate virtual IMU data from virtual textual descriptions of activities by combining ChatGPT, motion synthesis, and signal processing method
- 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.
- Enhanced modules of IMUTube, a computer vision-based pipeline for extracting virtual IMU data from videos.

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

Undergraduate Research Assistant (Advised by Dr. Glen Evenbly) Nov. 2021 - Jul. 2022

Georgia Institute of Technology *Atlanta, GA*

- Conducted research on using quantum-inspired tensor network as classifiers for supervised learning
- Implemented a training algorithm for the Matrix Product States (MPS)
- Tested and compared the performance of MPS, deep neural network (DNN), and convolutional neural network (CNN) on several bitstring rules, MNIST dataset, and Fashion-MNIST datset
- Benchmarked how well MPS, DNN, and CNN can learn random instances of each other

Publications

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*

Projects

American Sign Language Recogniton Mar. 2023 - Apr. 2023

- Processed and visualized Google's Isolated Sign Langauge Recogniton dataset (GISLR) from Kaggle
- Implemented deep learning models such as DNN, LSTM, ConvLSTM, and Transformer to predict signs from 3d poses
- Benchmarked and analyzed the models performance on GISLR

Technical Skills

Languages: Python, Java/JavaFX, C/C++, LC3 Assembly, LaTeX, UML, Bash, Matlab
Developer Tools: Git, Docker, VS Code, IntelliJ, Eclipse
Libraries: PyTorch, OpenCV, scikit-learn, NumPy, Keras, TensorFlow