Jiacheng Qiu

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EDUCATION

University of California, San Diego (UCSD), **Halıcıoğlu Data Science Institute (HDSI)**, San Diego, USA 3.910/4.00 GPA
Master's of Science in Data Science Sept 2023-June 2025
- Main coursework: Math Aspects of DL, Topological Data Analysis, Adv Data-Driven Text Mining, ML with Few Labels.

Kean University (Wenzhou Campus), Union, USA 3.956/4.00 GPA
Bachelor's of Science in Finance, Minor in Mathematics, Minor in Economics Sept 2019-June 2023
- Main coursework: Statistical Data Mining, Machine Learning, Big Data Computing, Quant Meth in Econ, Information Systems.

PUBLICATION

Zhang, Z.*, **Qiu, J.* (Co-First Author)**, Cui, S., Luo, Y & Rahman, T. (2024, October). Labits: Layered Bidirectional Time Surfaces Representation for Event Camera-based Continuous Dense Trajectory Estimation. The thirteenth International Conference on Learning Representations (ICLR2025 Under Review).

Qiu, J., Wang, W., & Chang, F. H. (2022, December). An Investigation of Skill Requirements in the Labor Market: Evidence from Online Job Posting in China. In Proceedings of the 2022 6th International Conference on Software and e-Business (pp. 97-103).

ACADEMIC RESEARCH

X2E simulator with RGB-like Representation (Work in Progress) Oct 2024-Present
Mobile Sensing and Ubiquitous Computing Lab, UMass Amherst & UC San Diego
Grad. Research Assistant, Co-author (Led by Asst. Prof. Tauhidur Rahman. Ph.D. Computing and Info Science, Cornell University)
- Developed an innovative RGB-like representation using an autoencoder. Integrated a novel set of loss frameworks—including GAN loss, Control-Channel loss, and Reconstruction loss.
- Developed the pioneering X2E model pipeline, trained on the MVSEC dataset, that converts multiple modalities—such as video, images, and text—into event streams. This versatile pipeline achieves consistent high-quality synthetic event generation.

Layered Bidirectional Time Surfaces for Event-based Continuous Dense Trajectory Estimation Apr 2024-Oct 2024
Mobile Sensing and Ubiquitous Computing Lab, UMass Amherst & UC San Diego
Grad. Research Assistant, Co-author (Led by Asst. Prof. Tauhidur Rahman. Ph.D. Computing and Info Science, Cornell University)
- Developed the **Labits-RAFT** architecture, setting a new standard in event-based dense continuous-time trajectory estimation. This pioneering innovation reduced trajectory endpoint error (TEPE) by **48.83%** and trajectory angular error (TAE) by **48.66%** on the MultiFlow dataset. It surpassed previous models and achieved an error reduction of over **50%** across all primary metrics, marking a major advancement in the field.
- Proposed **Layered Bidirectional Time Surfaces (Labits)**, a groundbreaking event representation that uniquely retains fine-grained temporal information, meaningful 2D visual patterns, and local speed cues. By replacing voxel grids with Labits, we achieved a significant **21.71%** reduction in TEPE and **21.49%** in TAE compared to the previous SOTA, setting a new standard for event-based representations in trajectory estimation.
- Introduced the Labits-to-APLOF net, a tailored model that translates Labits into Active Pixel Local Optical Flows (APLOF) and APLOF features, guiding dense trajectory estimation. This simple module further reduced TEPE by **27.13%** and TAE by **27.17%**. This innovation fully harnesses the motion details in Labits, unlocking its potential for broader applications in event-based vision tasks.

The Wages and Skills Requirements in Chinese Labor Market Apr 2022-Jul 2023
Summer Student Partnering with Faculty (SSpF) Research Program WKUSSPF202203 (2022) with ¥35,000 Grant
Undergrad. Research Assistant, Co-author (Led by Asst. Prof. Fa-Hsiang Chang. Ph.D. Economics, University at Buffalo—SUNY)
- Collected over **30** million rows of job postings (public) from 51job.com using multi-threaded crawlers; processed and cleaned the data in Python; and efficiently uploaded it to a TDSQL cloud database via MySQL for streamlined team access.
- Standardized job titles with SOC codes and categorized skills using a three-layer system, applying Word Segmentation, TF-IDF, Word2Vec, Levenshtein Distance, and Cosine Similarity in a well-designed matching algorithm.
- Computed city-occupation Herfindahl-Hirschman Index (HHI) to assess market concentration and competitiveness; developed weighted linear regression models to analyze the wage impact of specific skills, incorporating various controls for robust statistical validation.

WORK EXPERIENCE

United Rural Cooperative Bank of Hangzhou (URCB), Hangzhou, China Jul 2021-Aug 2021
Fraud Detection Intern
- Developed a hybrid fraud detection system that combines SVM and Neural Networks to enhance accuracy and reduce false positives.
- Engineered and trained risk assessment models using Random Forests, enhancing the predictive accuracy by **6.21%** based on historical payment records and setting a benchmark for future model improvements.

HONORS & AWARDS

Dean's Scholarship Dec 2022
Outstanding Graduate Award June 2023

SKILLS& INTEREST

Language & Tool: •Python •Pytorch •TensorFlow •R •SQL •SPSS •STATA •MATLAB •Bash •Git •Kubernetes •Docker •Web Crawlers
Research Interest: •Computer Vision •Event Camera •Dynamic Vision Sensor •Trajectory Estimation •Human Pose Estimation •Optical Flow Estimation •Signal Processing •Depth Estimation •Graph Neural Network •Reinforcement Learning
Others: •Ultimate Frisbee •Surfing •Fishing •Travelling