Panfeng Jiang

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Research Interests

- Previously Interested In: Event-based Vision, Spatial AI, SLAM
- Currently Interested In: AI Interpretability, Reinforcement Learning, Vision–Language Models for Social Navigation

Education

University of California, Berkeley — Berkeley, CA, US
Concurrent International in GLOBE Program, Major: Computer Science (GPA:3.81/4.0) — Aug 2024 – Jun 2025

ShanghaiTech University — Shanghai, China
B.Eng. in Computer Science, Minor in Mathematics & Applied Math (GPA:3.81/4.0, ranked 12/169) — Sep 2022 – Present

Honors And Awards

Outstanding Winner Award , Mathematical Contest In Modeling 2025 (MCM) — May 2025
AMS(American Mathematical Society) Award , Mathematical Contest In Modeling 2025 (MCM) — May 2025
First Place Winner, Bay Area Data Science Summit 2025 — Mar 2025
Provincial Third Prize, China Undergraduate Mathematical Contest in Modeling 2024 (CUMCM) — Nov 2024
Department Prize for **Outstanding Student** Performance, ShanghaiTech University — Nov 2023

Publications

1.H. Su, T. Liu, **P. Jiang**, L. Gao, and L. Kneip, *"LED matrix-based simultaneous localization and data transmission with an event camera,"* (In preparation for submission in July 2025).

2.H. Su, Y. Feng, D. Gehrig, **P. Jiang**, L. Gao, X. Lagorce, and L. Kneip, *"A Linear N-Point Solver for Structure and Motion from Asynchronous Tracks,"* (ICCV 2025).

Research Experience

Research Assistant, University of North Carolina, Chapel Hill — Remote
Research Advisor: Prof. Weitong Zhang, University of North Carolina, Chapel Hill — Apr 2025 – Present

- Our work focuses on refining Thompson sampling for complex sequential decision problems, where we analyze and enhance posterior update strategies to achieve faster convergence and greater sample efficiency. Concurrently, we develop distributionally robust RL algorithms that optimize policies under worst-case distributional shifts, thereby bolstering robustness and generalization in uncertain environments.

Research Assistant, Mobile Perception Lab, ShanghaiTech University — Shanghai, China
Research Advisor: Prof. Laurent Kneip, ShanghaiTech University — Apr 2023 – Mar 2025

- Developed the core detection part that identifying LED matrices in real-time and contributed to the development of the LED encoding and tracking modules for first publication, ensuring precise localization and seamless data transmission.
- Integrated feature trackers such as ArcStar and RATE for the second publication, enabling the system to record temporally varying keypoints. This core part improves the extraction of event-based feature point locations, providing the solver with richer and more accurate tracking information for egomotion estimation.

Working Experience

Research Assistant Intern, RoboScience Co., Ltd. — Shenzhen, China
Research Advisor: Prof. Lin Shao, National University of Singapore — Incoming June 2025 – Sep 2025

- Our work is to design and implement an Adapter that leverages large vision–language models (e.g., LLAVA-8B) to sample and project navigational subgoals onto live camera images, integrating grounding (SAM2), sidewalk tracking, and traffic-signal detection to update the local cost map.
- Fuse these VLM-driven perceptions with odometry and point-cloud data to drive DWA/TEB planners for dynamic, collision-aware autonomous navigation.

Projects

Rebalancing Nature's Scale: A Model to Tame Overtourism — [Overview] [Paper]
Mathematical Contest in Modeling (MCM) 2025 — Feb 2025 - Mar 2025

- **This project earned the Outstanding Winner Award and AMS Award in MCM 2025.**
- We developed a dynamic STDM using coupled ODEs to model interactions and designed intervention strategies combining tax-revenue allocation with policy impact vectors, then evaluated them with AHP scoring to select optimal policies. Our model achieved outstanding performance, effectively resolving overtourism issues in Juneau and Big Sur in our simulation experiments.

Multi-Layer Perceptron for Optimal Equity Derivative Hedging — [Overview] [Slides]
Bay Area Data Science Summit 2025 — Feb 2025 – Mar 2025

- **This project won the first place in the BADSS 2025.**

- My contribution is developing the Multi-Layer Perceptron, architecting its structure to effectively capture complex, non-linear market dynamics. By integrating real-time data processing, exposure-PnL mapping, and dynamic greedy strategy, our model can intelligently adapt to evolving market conditions.

Beyond the LRH in LLMs: Controlled Perturbations and Concept Subspaces [Poster] [Paper]

Project of CS182: Designing, Visualizing and Understanding Deep Neural Networks Mar 2025 - May 2025

- Developed a framework for fine-grained control of large language models by introducing curvature-based and gradient-stability bounds to ensure locally linear interventions, and generalized concept representation to multi-dimensional subspaces.
- Demonstrated improved fidelity and robustness in sentiment, factuality, and style-transfer tasks through statistically validated concept subspaces and nonlinear steering via lightweight MLPs.

Interactive VR Mesh Deformation via Hand-Object Interaction

Project of CS184: Foundations of Computer Graphics Mar 2025 - May 2025

- Developed a real-time VR mesh deformation system using Unity and Meta Quest 3, enabling dynamic object manipulation via hand tracking.
- Implemented GPU-accelerated compute shaders for realistic soft-body physics with tunable parameters (elasticity, drag, etc.), outperforming baseline methods in responsiveness and visual fidelity. Enhanced immersion through multi-object interaction and custom shader-based rendering.

Disentangling Object Motion for Self-supervised Depth Estimation

Projects of CS172: Computer Vision I Sep 2023 – Jan 2024

- Led the development of a motion disentanglement module that segments dynamic objects and compensates for their motion, significantly reducing depth estimation errors.
- Designed and implemented an occlusion-aware cost volume and a re-projection loss function, improving depth consistency in challenging dynamic scenes.

Instance-level 6-DoF Object Pose Estimation with an Event Camera

Projects of CS284: Simultaneous Localization and Mapping Feb 2024 – Jun 2024

- Developed a real-time 6-DoF object pose estimation system utilizing event-based vision, enabling precise tracking under rapid motion and challenging lighting conditions.
- Developed a multi-step pose estimation pipeline integrating convex hull extraction, CAD model alignment, and ICP-based refinement, significantly improving accuracy and robustness.

Hybrid ML for Quality Prediction: Huber Loss Optimization and PCA-Driven Insights

Projects of CS182: Introduction to Machine Learning Feb 2024 – Jun 2024

- Conducted a comparative analysis of logistic regression, random forest, and XGBoost for quality prediction, evaluating their performance across diverse datasets.
- Developed a dimensionality reduction strategy using Principal Component Analysis (PCA) to enhance feature interpretability and reduce computational complexity.Refined model robustness by incorporating Huber Loss, mitigating the impact of outliers and improving predictive accuracy in real-world scenarios.

Social Participation

Staff & Referee Various Locations

Rubik's Cube Competitions Jul 2023 – Mar 2025

- Actively served as staff and referee for multiple official Rubik's Cube competitions, including Bay Area Speedcubin' 65 - Berkeley 2024, Berkeley Fall 2024, Berkeley October Weekday Tricubealon 2024, Cool Down Berkeley 2024, and Changsha Rubik's Cube Open 2023. Ensured fair play, managed competitor flow, and assisted in overall event logistics.

Volunteering Shanghai, China

Various Organizations Aug 2023 – Aug 2024

- Assisted with event organization at ShanghaiTech summer camp, Shanghai Planetarium, and Shanghai Library.
- Contributed to the 2023 Shanghai Marathon by coordinating logistics and supporting participants.

Teaching Experience

Teaching Assistant Shanghai, China

New Oriental Education & Technology Group Inc Jul 2023 – Aug 2023

- Supervised course quality, managed homework assignments, and provided academic support to students.
- Led Q&A sessions and assisted in refining course content to improve student engagement.

Misc

- **Skills:** C/C++, Python, ROS (Robotic Operation System), Latex
- **Languages:** English (TOEFL iBT: 106, C1 Level), Mandarin Chinese (Native).