

Chao-Jung Lai

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EDUCATION

University of California, San Diego

MS in Computer Science Engineering

09/2024 – Present

San Diego, CA

- GPA 4.0/4.0
- Courses: Computer Vision I & II, LLM Reasoning, Deep Learning, Data Systems for ML, Data Mining & Analytics

National Taiwan University

BSc in Computer Science

09/2018 – 12/2023

BSc in Mechanical Engineering

Taipei, Taiwan

- GPA 4.15/4.3 (Rank top 2%, 🏆 Academic Achievement Awards × 5 semesters)
- Courses: Web Programming, Software Engineering Design, Object-Oriented Design, Operating Systems, Computer Architecture

SKILLS

Programming

C/C++, C#, Java, Python, JavaScript, TypeScript, Bash scripting, Matlab, SQL

Web Development

React, React Native, Node.js, MongoDB, Express, GraphQL, Apollo

Tools

Linux, Git, Docker, Jira, Azure, AWS, Jenkins, Datadog, Figma, Expo, Unity

Machine Learning

PyTorch, LangChain, Numpy, OpenCV, Spark, Scikit-learn, Triton, Pydantic

EXPERIENCE

Glydways

Perception Software Engineer Intern

06/2025 – Present

South San Francisco, CA

- Assisting in the early development of ML perception models for adverse weather and sensor anomalies in autonomous systems

Dynamic Graphics Project Lab, University of Toronto

Research Assistant (Advisors: Prof. Tovi Grossman, Dr. Ludwig Sidenmark)

05/2023 – 09/2024

Toronto, Canada

- Developed an adaptive system to dynamically adjust user interaction methods in Virtual Reality (VR), focusing on designing user-centric and responsive software solutions
- Engineered a highly optimized real-time computational system using Unity (C#), ensuring performance stability at 60fps
- Applied computational geometry and multi-objective optimization to enable context awareness in VR, demonstrating expertise in scalable software design and complex data modeling

SELECTED PROJECTS

From Prompt to Pixel: Fine-Grained Image Editing via Grounding and Inpainting

04/2025 – 07/2025

- Build a text-guided image editor using diffusion models, addressing prior methods that overpaint images or lack spatial control
- Developed a pipeline with LLaVA, Grounded-SAM, ControlNet, and SDXL for region-specific inpainting and data generation
- Achieved 81% lower FID and 3× better Local FID than DiffEdit on COCO and OpenImages; currently training a ControlNet mask generator on 50,000+ prompt-engineered samples via distributed multi-GPU processing

Context-Aware AR System with Semantic Segmentation for Low-Vision Navigation

09/2024 – 02/2025

- Designed an augmented reality (AR) system for low-vision navigation to enhance situational awareness and independent mobility
- Implemented real-time image segmentation with SAM2 in Python for precise detection and adaptive visual cues in AR
- Built a multi-device system integrating Android watch, Meta Quest 3, RealSense camera, and a high-end Linux server, utilizing WebSocket for low-latency, real-time data synchronization and seamless user interaction

Do Vision-Language Models Have Internal World Models? Toward an Atomic Evaluation

09/2024 – 02/2025

(ICLR Workshop 2025)

- Proposed a two-stage framework examining whether VLMs serve as generalist world models
- Designed and conducted empirical tests of VLMs' reasoning capabilities for robotic manipulation using photo-realistic simulations
- Developed a large-scale testing pipeline with over 69,000 diverse robotic interaction scenarios, integrating VLM-based visual question answering to evaluate state transition prediction

Tint Your Day: An Interactive Full-stack Drawing Journal App

09/2022 – 01/2023

- Developed a cross-platform mobile app for Android and iOS using the Expo platform, enabling users to journal through threaded entries and a mood-reflective watercolor canvas
- Designed and implemented a full-stack solution using the MERN stack (MongoDB, Express, React, Node.js), incorporating GraphQL and Apollo for efficient and scalable backend operations

PUBLICATIONS

- c1 **Adaptique: Multi-objective and Context-aware Online Adaptation of Selection Techniques in Virtual Reality.** C.-J. Lai, M. Sousa, T. Zhang, L. Sidenmark, T. Grossman. UIST, 2025
- c2 **AirRacket: Perceptual Design of Ungrounded, Directional Force Feedback to Improve Virtual Racket Sports Experiences.** C.-Y. Tsai, I.-L. Tsai, C.-J. Lai, D. Chow, L. Wei, L.-P. Cheng, M. Y. Chen. CHI 2022 🏆 **Best Paper Award**
- c3 **AirCharge: Amplifying Ungrounded Impact Force by Accumulating Air Propulsion Momentum.** P.-Y. Chen, C.-Y. Tsai, W.-H. Wang, C.-J. Lai, C.-A. Fan, S.-C. Lin, C.-C. Chi, M. Y. Chen. UIST, 2023