

# CHUN-MAO (MICHAEL) LAI

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## EDUCATION

### University of California San Diego

*MS. in Computer Science and Engineering*

- Courses: Operating Systems, Principles of Database Systems, Recommender Sys and Web Mining, etc.

09/2024 – 06/2026

*La Jolla, California*

### University of Illinois Urbana-Champaign

*Exchange Program in Electrical and Computer Engineering*

- GPA: 4.0/4.0; Courses: Machine Learning, The Principles of Safe Autonomics, Distributed Systems.

08/2023 – 12/2023

*Urbana, Illinois*

### National Taiwan University

*BSE. in Electrical Engineering*

- GPA: 4.15/4.3; Five Machine Learning publications; One-time Dean's List recipient.
- The Member of Phi Tau Phi Scholastic Honor Society of the Republic of China.

09/2020 – 06/2024

*Taiwan*

## SKILLS/QUALIFICATIONS

|                  |  |
|------------------|--|
| Programming      | Python, C/C++, Javascript/Typescript, Golang, Swift, LaTeX                                 |
| Data Analysis    | MySQL, PostgreSQL, MongoDB, Redis  |
| Web Development  | HTML/CSS, React, NextJS, Tailwind, ThreeJS, ExpressJS, GraphQL, Prisma, Flask              |
| Technology       | Git, Docker, Kubernetes, GoogleAPI, TensorFlow, PyTorch, Huggingface                       |
| Machine Learning | Large Language Model, Natural Language Processing, Computer Vision, Reinforcement Learning |

## WORK EXPERIENCE

### Open Source - Flyte

*Open Source Developer*

- Contribute to the Flyte project, a machine learning and data processing platform primarily written in Golang and Python, with a codebase of over 1,000,000 lines.
- Developed the interface for remote execution in Flytekit, improving usability in Jupyter notebooks.
- Enabled unsafe typing in Flytekit, facilitating easier migration of existing codebases by allowing developers to bypass type checking.
- Fixed the usage of the Any type in Flytekit, allowing the correct use of Any type via the command line with the Click package.

04/2024 – Present

*Remote*

### Appier

*AI Research Scientist Intern*

- Enhanced machine learning algorithms in a recommendation system using Diffusion Models to address data inefficiency and imbalance, reducing performance drop by 25%.
- Analyzed experimental results to derive key insights and contributed to academic paper writing for the research team.

06/2024 – 08/2024

*Taiwan*

### Taiwan Semiconductor Manufacturing Company(TSMC)

*Machine Learning Research Engineer Intern*

- Designed and developed an innovative pairwise Style Transfer model for super-resolution images (3M pixels per image), resulting in a 50% reduction in error rates.
- Optimized the data pipeline with Python MPI for image extraction and processing, achieving a 75% reduction in processing time.
- Implemented TensorFlow distributed computing across 2 nodes with 4 A100 GPUs each, boosting training efficiency by 5 times.

06/2023 – 07/2023

*Taiwan*

## EXTRACURRICULAR ACTIVITIES & LEADERSHIP

### NTUEE Light Dance

*Software Leader, <https://www.youtube.com/@ntueelightdance6849>*

- Led a 25-member team responsible for developing the Light Dance editor service, managing a substantial codebase of 800,000 lines.
- Built the backend service from scratch to facilitate the storage of light dance data (up to 5GB) on a server and provide a co-editing environment.
- Optimized data structure with SQL-based database, reducing client-side latency to less than 1 second per operation.
- Achieved significant visibility with 40,000 views on YouTube for the Light Dance video in 2022.

09/2021 – 07/2023

*Taiwan*

### NTUEE Student Association Information Department

*Minister, <https://github.com/NTUEEInfoDep>*

- Led a team of 40 individuals in producing and maintaining student association websites and services, which included 8 long-standing services and various activity-based services, benefiting over 1,000 students.
- Offered weekly technical courses to NTUEE students and trained department members in website and service development.
- Collaborated with the Student Association to organize NTUEE Week, NTUEE Night, MakeNTU, and other departmental activities.

09/2020 – 07/2023

*Taiwan*

## SELECTED PROJECTS

### NTUEE Course Pre-selection Website

*Project Leader, NTUEE Student Association Information Department*

- Designed and implemented an algorithm based on the stable marriage problem to ensure accurate and fair distribution among 1,000 department students, considering their preferences and complex priority rules.
- Utilized Docker to manage services during course selection for 5 semesters, ensuring a smooth user experience for all students.

01/2021 – 07/2023

### Infant Monitor

*MakeNTU Contestant, Best Creativity Prize, STMicroelectronics Company Prize 1st Place*

- Developed a real-time infant monitor system that detects the infant's status and sends alerts to parents' mobile phones.
- Designed a decision-making system using MediaPipe to control 14 servo motors, ensuring the infant is turned to a safe position.

05/2024

## PUBLICATIONS

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|   |                                |
|---|--------------------------------|
| <b>Diffusion-Rewards Adversarial Imitation Learning</b><br><i>The Thirty-eighth Annual Conference on Neural Information Processing Systems (<b>NeurIPS 2024</b>)</i> (Under Review)                     | <b>First Author</b><br>05/2024 |
| <b>Diffusion Imitation from Observation</b><br><i>The Thirty-eighth Annual Conference on Neural Information Processing Systems (<b>NeurIPS 2024</b>)</i> (Under Review)                                 | <b>Co-Author</b><br>05/2024    |
| <b>Diffusion Model-Augmented Behavioral Cloning</b><br><i>The Forty-first International Conference on Machine Learning (<b>ICML 2024</b>)</i>   | <b>Co-Author</b><br>09/2024    |
| <b>Controllable User Dialogue Act Augmentation for Dialogue State Tracking</b><br><i>The 23rd Annual Meeting of the Special Interest Group on Discourse and Dialogue (<b>SIGDIAL 2022</b>)</i>          | <b>First Author</b><br>09/2022 |
| <b>AV-SUPERB: A Multi-Task Evaluation Benchmark for Audio-Visual Representation Models</b><br><i>2024 IEEE International Conference on Acoustics, Speech and Signal Processing (<b>ICASSP 2024</b>)</i> | <b>Co-Author</b><br>12/2023    |