

# Stone Tao

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## Education

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**PhD Student in Computer Science and Engineering** 2023 –  
University of California, San Diego. Advisor: Hao Su

**B.S. Double Major in Computer Science and Cognitive Science, Math Minor** 2019 – 2023  
University of California, San Diego. 3.98/4.00 GPA

- **Graduate Courses:** Computer Vision (ML meets Geometry), ML for Robotics, Differentiable Programming, Recommender Systems, Embodied AI.
- **Undergraduate Courses** Decision-Making in the Brain, Parallel Computing, Statistical NLP, Advanced Optimization Methods for Data Science, Advanced Data Structures, Operating Systems, Multiple Probability and Stats Courses, Foundations of Real Analysis, Honors Calculus, and more.

## Selected Awards

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**National Science Foundation Graduate Research Fellowship** 2023-2028  
**UCSD CSE Alumni Advisory Board Leadership Excellence Scholarship** 2021-2022

## Publications / Preprints

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### Abstract-to-Executable Trajectory Translation for One-Shot Task Generalization

International Conference on Machine Learning (ICML) 2023.

Stone Tao, Xiaochen Li, Tongzhou Mu, Zhiao Huang, Yuzhe Qin, Hao Su.

[arXiv](#) | [project page](#)

### Emergent Collective Intelligence From Massive-Agent Cooperation and Competition

In Submission. Neural Information and Processing Systems (**NeurIPS**) 2022 Deep RL Workshop.

Hanmo Chen\*, Stone Tao\*, Jiaxin Chen, Weihao Shen, Xihui Li, Sikai Cheng, Xiaolong Zhu, Xiu Li.

[arXiv](#)

### ManiSkill2: a Unified Benchmark for Generalizable Manipulation Skills

International Conference on Learning Representations (**ICLR**) 2023

Jiayuan Gu†, Fanbo Xiang†, Xuanlin Li\*, Zhan Ling\*, Xiqiang Liu\*, Tongzhou Mu\*, Yihe Tang\*, Stone Tao\*, Xinyue Wei\*, Yunchao Yao\*, Xiaodi Yuan, Pengwei Xie, Zhiao Huang, Rui Chen, Hao Su.

[arXiv](#) | [project page](#)

### Maniskill: Generalizable manipulation skill benchmark with large-scale demonstrations

Neural Information and Processing Systems (**NeurIPS**) 2021 Datasets and Benchmarks Track

Tongzhou Mu\*, Zhan Ling\*, Fanbo Xiang\*, Derek Cathera Yang\*, Xuanlin Li\*, Stone Tao, Zhiao Huang, Zhiwei Jia, Hao Su.

[arXiv](#) | [project page](#)

## Experience

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**UC San Diego: Hao Su Lab**, Undergraduate Researcher, Advisor: Hao Su 2020 – 2023

- Research on robotics and embodied AI, particularly tackling long-horizon problems. Leveraging reinforcement learning, few-shot learning, imitation learning, and transformers.
- Research and develop large-scale robotic manipulation benchmarks (ManiSkill2).

**UC San Diego: ProtoLab**, Undergraduate Researcher, Advisor: Steven Dow 2019 – 2023

- Research at the intersection of AI and HCI, particularly AI-assisted tools and using NLP in systems requiring in-depth synthesis of information such as peer-review systems.
- Developed the Design for San Diego competition's front and backend.

**Lux AI Challenge**, Co-Founder 2021 –

- Lead the research, development, and design of creative, accessible, and inclusive AI competitions.

- Season 1 finished with 1,100+ teams, 800+ github stars, 22,000+ submissions, 8,000,000+ matches run, and had one of the most diverse group of participants ever. Enabled competitors to research novel deep RL and IL methods to a unique large-scale multi-agent problem.
- Currently working on season 2 in collaboration with Kaggle.

**QuantCo**, ML Engineer Intern, Advisor: T. Ben Thompson 2021

- Researched high-precision and accurate function approximation using neural nets and decision trees. Help automatically migrate slow, complex, hand-built computations in old systems to new systems.
- Developed OCR+NLP tools for analysis of insurance documents.

**LaunchDarkly**, Software Engineer Intern 2020

- Worked full stack on feature workflows, semantic patches, and conflict handling to enable state independent scheduling of feature flagging, a feature requested by LaunchDarkly's largest business customers.

## Leadership

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**Co-Founder of the Lux AI Challenge** 2021 –

Initiated the original project concept and invited others to co-found the non-profit organization and competition. Successfully held one of the largest multi-agent AI competitions in collaboration with Kaggle. Raised over \$80,000 in funds for the competition.

**Founding President of ACM AI at UC San Diego** 2020 – 2022

Founded the largest organization on AI at UC San Diego, seeking to cultivate a community of AI enthusiasts as well as lower the barriers for learning AI. Grew the organization from zero to 1000+ members in 2 years, working with my board to develop social events, workshops, seminars, and competitions.

## Current Student Mentees

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**Kevin Chan** (BS UC San Diego, Regent's Scholar) 2022 –

**Dors Zhang** (BS UC San Diego, Regent's Scholar) 2022 –

## Presentations / Talks

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**Lux AI Season 2 and Reinforcement Learning** 2023

Joined the Kaggle Podcast to talk about the basics of reinforcement learning and discuss Lux AI Season 2.

[Youtube recording](#)

**AI Competition Design For Multi-Agent Environments / Games** 2022

Presented at the Learning in Foundation Environments meeting organized by Joseph Suarez. I discussed insights from designing the Lux AI challenge and what made it a popular AI competition, addressing topics such as environment design as well as competition accessibility.

[Slides](#)

## Teaching

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**UC San Diego: CSE 291 Machine Learning for Robotics** 2023 Winter

Wrote various course materials and Google Colab notebooks covering robotics, robotics environments, reinforcement learning, and imitation learning.

**UC San Diego: CSE 12 Basic Data Structures and Object-Oriented Design** 2020 Spring

Held office hours and wrote unit tests for grading homework automatically in Java.

## Open Source Projects

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**Robojax** 2022 –

A high-performance Jax-based library with RL algorithms and other approaches with a focus on robotics. Provides fast implementations of various computer vision tools for RGBD and pointcloud processing.

[stonet2000/robojax](https://github.com/stonet2000/robojax)

## Lux AI Challenge

2021 –

Code for the Lux AI Challenge, including the AI environments and visualizers.

[Lux-AI-Challenge](#)

## Reinforcement Learning Gym and Library in Typescript

2021

Implements a gym interface and algorithms like PPO and DQN in Typescript for reinforcement learning on browsers and Node.js.

[stonet2000/rl-ts](#)

## Academic Service

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IROS 2023

Reviewer | 2023

SIGGRAPH 2023

Assisted Review | 2023

## Other Awards

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UCSD Provost Honors List (every year)

2019-2023

MIT Battlecode (AI Competition) Finalist

2019-2021

Made finals 3 times in a row (2019-2021), placing 1st out of all soloists and 5th overall in 2020, competing against over 600 teams of high school to graduate students. Won the Five Rings adaptive strategy award for spearheading an influential strategy in 2021.

## Skills

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**Programming Languages:** Python, Typescript/Javascript, C/C++, Go, Java, SQL

**AI:** Reinforcement Learning, 2D/3D Computer Vision, Deep Learning, Tree Learners, Embodied AI

**Frameworks:** Jax, Pytorch, Tensorflow, Pandas, scikit-learn, Node.js, React, MongoDB, Express.js

**Tools:** Docker, Google Cloud, Jupyter Notebook/Lab, Git, Adobe Photoshop, Figma

## Interests

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**Languages:** English, Chinese

**Sports:** Fencing (Saber), Fencing Coaching

**Music:** Violin, Viola