

# Xianliang Li

Email: xl.li4@siat.ac.cn | Webpage: yinleung.com

## RESEARCH INTEREST

---

Optimization, with a focus on theoretical performance and convergence analysis for machine learning and robotics systems. My goal is to propose practical, self-consistent frameworks for machine learning and to develop specific, effective optimization methods based on these theories.

## EDUCATION

---

**University of Chinese Academy of Sciences**

Sep. 2022 - Present

Master's Degree in Computer Science

Advisors: Assoc. Prof. Sheng Xu

**Sun Yat-Sen University**

Sep. 2018 - Jun. 2022

Bachelor's Degree in Physics

Advisor: Assoc. Prof. Shangfei Liu

## PUBLICATIONS

---

### 3. Time-of-Arrival Simultaneous Sensor and Target Localization with Dynamic Optimal Sensor Placements.

Xianliang Li, Sheng Xu, K. C. Ho.

*Under Review, 2024.*

### 2. Systematical Sensor Path Optimization Solutions for AOA Target Localization Accuracy Improvement with Theoretical Analysis.

Sheng Xu, Bing Zhu, Xianliang Li, Xinyu Wu, Tiantian Xu.

*IEEE Transactions on Vehicular Technology, 2024.*

### 1. 3D Source Tracking Using a Position-unknown AOA Sensor with Measurement Drift and UAV Moving Direction Optimization

Rongrong Xu, Sheng Xu, Bing Zhu, Xianliang Li, Mingxue Cai.

*IEEE International Conference on Real-time Computing and Robotics, 2024.*

## RESEARCH EXPERIENCE

---

**On the Performance Analysis of Momentum Methods in Stochastic Optimization**

Mar. 2024 - Present

Team Leader

- Conducted theoretical performance analysis for the momentum-based optimizer.
- Developed an optimized momentum-based method, with numerical experiments validating the theoretical claims and demonstrating remarkable performance.
- Preparing a manuscript for submission to ICLR 2025.

**Path Optimization and Target Localization Problems using TOA/AOA Sensors**

Jul. 2023 - Present

Advisor: Assoc. Prof. Sheng Xu, *Shenzhen Institute of Advanced Technology* and Prof. K. C. Ho, *University of Missouri*

- Derived theoretical performance enhancements using position-unknown sensors with inter-sensor measurements.
- Developed a new, effective, and fast-converging algorithm based on SPSA and Adam for optimal sensor placement, with theoretical analysis supporting improved performance.
- Designed a compound localization framework for real-world applications.
- Submitted two journal papers and one conference paper; one journal manuscript is in progress.

**A Wheel-track Transformation Mobile Platform**

Nov. 2023 - Apr. 2024

Advisor: Assoc. Prof. Sheng Xu, *Shenzhen Institute of Advanced Technology*

- Participated in developing a control module of the wheel-track robot using the PX4 flight controller and the Maxon controller.
- Gained knowledge and skills in hardware and robotic systems.

**N Body Gravitational Simulation of Giant Planets in the Solar System**

Nov. 2021 - Apr. 2022

Advisor: Assoc. Prof. Shangfei Liu, *Sun Yat-sen University*

- Undergraduate Thesis.
- Reproduced the formation process of Uranus and Neptune in the solar system using REBOUND.
- Acquired knowledge and skills in astrophysics and C programming.

## TECHNICAL SKILLS

---

**Programming:** MATLAB, Python, C/C++.

**DevOps and AI Framework:** Git, PyTorch.

**Language:** Cantonese, Mandarin, English.