

# Kaiwen Xiong

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## Education

Shanghai Jiao Tong University

Aug 2023 – Jun 2027 (estimated)

- GPA: 3.95/4.3      Score: 91.35/100
- Major: Automation
- Related coursework: Calculus, Linear Algebra, C++ programming, Data Structures, Probability and Statistics, Discrete Math, Robotics, Digital Image Processing, Pattern Recognition, Analog Circuits
- TOEFL: 95 (Reading: 29 Listening: 25 Speaking: 20 Writing: 21)

## Research Interests

Previous work: state estimation of unmanned system

Interested field: embodied AI, reinforcement learning, robot learning, motion planning and control

## Research Internships

The State Key Laboratory of Mechanical System and Vibration, Shanghai  
Jiao Tong University, Shanghai, China

Oct 2023 – Oct 2024

Research topic: Autonomous Observation and Control of Unmanned Aerial Vehicles

## Publications

Kaiwen Xiong, Sijia Chen, Wei Dong, "An Adaptive Sliding Window Estimator for Positioning of Unmanned Aerial Vehicle Using a Single Anchor", arXiv preprint 2024. [[arxiv:2409.06501](https://arxiv.org/abs/2409.06501)]

## Projects

Adaptive Positioning of Unmanned Aerial Vehicle

Mar 2024 – Oct 2024

- Based on our research group's previous work, an adaptive estimator is constructed to track the state of unmanned aerial vehicle and simultaneously adjust covariance and aerial drag coefficients.

Analysis for Sensitivity of estimator

Jan 2024 – Feb 2024

- By assuming initial bias, the error propagation relation for an estimator in our group's previous work is derived. Its sensitivity to the initial value is proven to depend on covariance parameters.

Algorithm Design for Autonomous Camera Calibration

Dec 2023

- By researching the invariant nature of autonomous rotating camera, the key issue of its calibration is transformed into a solvable problem similar to fixed camera calibration. Hence, an online algorithm is developed to calibrate the extrinsic matrix.

Line-following Robot

Oct 2023 – Dec 2023

- Five optical units are deployed on the unmanned ground vehicle to perceive the difference between line markers and surroundings. Based on this, a discrete control algorithm is designed to steer the vehicle to track the line.

## Skills

Programming/Language: C/C++, MATLAB, Python/PyTorch,  $\text{\LaTeX}$ , Markdown

Operation system/Framework: Linux, ROS

Tools: VS Code, Vim, CMake, Solidworks, Arduino, Git, Adobe Illustrator, Photoshop