

# JIUHONG XIAO

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## EDUCATION

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- New York University** Sep 2022 - Dec 2026 (Expected)  
*Ph.D. in Electrical and Computer Engineering*
- New York University** Jan 2020 - Dec 2021  
*M.S. in Computer Science*
- University of Science and Technology Beijing** Aug 2015 - Jun 2019  
*B.Eng. in Intelligence Science and Technology*

## EXPERIENCE

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- New York University** Sep 2022 - Present  
*Ph.D. Student Researcher*
- Developed a UAV thermal geo-localization system by aligning multi-modal data (thermal imagery and satellite maps) to enhance nighttime outdoor navigation.
  - Designed a unified global-local geo-localization pipeline (initialization, tracking, re-localization) achieving  $\sim 20$  m positional accuracy at  $\sim 500$  m flight altitude.
  - Enabled real-time operation (20 FPS) over a large-scale search region ( $1.5 \text{ km} \times 1.5 \text{ km}$ ), significantly extending mission capabilities in low-visibility environments.
- Amazon** Jan 2022 - Aug 2022  
*Applied Scientist*
- Contributed to Amazon Go/Just Walk Out (JWO) technology, focusing on multi-camera perception for seamless, cashier-less shopping experiences.
  - Designed and deployed a multi-view occlusion detection system to automatically identify and mitigate unknown occluders (e.g., equipment, signage), improving overall detection accuracy.
  - Collaborated with cross-functional teams (software engineers and store operations) to integrate real-time occlusion alerts, reducing store downtime and cutting manual monitoring overhead.
  - Implemented automatic pipelines for model training and inference, enabling scalable and low-latency solutions across multiple Amazon Go locations.
- Amazon** May 2021 - Aug 2021  
*Applied Scientist Intern*
- Developed a VAE-based compression pipeline tailored to face images, achieving a 5x compression ratio over HEVC while maintaining recognition quality.
  - Jointly optimized the compression and face recognition models to reduce file size to 27.4% of HEVC, enabling a lower False Rejection Rate under the same False Acceptance Rate.
  - Trained and evaluated the approach on a large-scale facial dataset, demonstrating consistent performance across diverse appearance and environment conditions.
- New York University** May 2020 - May 2021  
*Research Assistant (advised by Alfredo canziani, Yann LeCun)*
- Developed an offline RL pipeline for autonomous driving, leveraging annotated lane maps and limited historical driving data to train robust lane-following policies.
  - Designed novel training strategies and loss functions to lower lane annotation costs while enhancing generalization across various lane configurations.
  - Achieved a mean survival rate of 86% (up from 75%), effectively reducing collisions and offroad incidents compared to baseline offline RL methods.
- Intelligent Biomimetic Design Laboratory, Peking University** Jun 2019 - Jan 2020  
*Research Assistant (advised by Tianhao Zhang, Guangming Xie)*
- Combined top-down and bottom-up approaches to build a new fish pose estimation method, increasing mAP by 7.9% and 10.9% over classical single-paradigm baselines, respectively.
  - Developed a keypoint-based pose tracking system, reducing tracking error by 72.7% with real-time performance.
  - Constructed a robotic fish dataset with 1,300+ annotated frames, establishing a benchmark for fish pose estimation and supporting advanced fish group control research.

## SELECTED PUBLICATIONS

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### **UASTHN: Uncertainty-Aware Deep Homography Estimation for UAV Satellite-Thermal Geo-localization.**

Jiuhong Xiao, Giuseppe Loianno.

*IEEE International Conference on Robotics and Automation (ICRA)*, 2025.

### **VG-SSL: Benchmarking Self-supervised Representation Learning Approaches for Visual Geo-localization.**

Jiuhong Xiao, Gao Zhu, Giuseppe Loianno.

*IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2025.

### **STHN: Deep Homography Estimation for UAV Thermal Geo-localization with Satellite Imagery.**

Jiuhong Xiao, Ning Zhang\*, Daniel Tortei\*, Giuseppe Loianno.

*IEEE Robotics and Automation Letters*, 2024.

### **Long-range UAV Thermal Geo-localization with Satellite Imagery.**

Jiuhong Xiao, Daniel Tortei, Eloy Roura, Giuseppe Loianno.

*IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023.

### **Identity Preserving Loss for Learnt Image Compression.**

Jiuhong Xiao, Lavisha Aggarwal, Prithviraj Banerjee, *et al.*

*IEEE/CVF Computer Vision and Pattern Recognition (CVPR) Workshops*, 2022.

### **Multi-Robot Collaborative Perception with Graph Neural Networks**

Yang Zhou, Jiuhong Xiao, Yue Zhou, Giuseppe Loianno

*IEEE Robotics and Automation Letters*, 2022.

(Visit <https://xjh19971.github.io/> for a full publication list.)

## SELECTED TECHNICAL PROJECTS

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### **Autonomous Drone Inspection with Deep Reinforcement Learning**

Sep 2021 - Dec 2021

*Advisors: Lerrel Pinto. New York University*

- Built a ROS-based deep reinforcement learning framework for real-world UAV inspection tasks, enabling robust autonomous flight under partial occlusions.
- Investigated multiple occlusion scenarios to evaluate system performance, providing insights for improved policy generalization and inspection reliability.

### **Autodetection: An End-to-end Autonomous Driving Detection System**

Jan 2020 - May 2020

*Advisors: Yann LeCun, Alfredo Canziani. New York University*

- Secured 2<sup>nd</sup> place in the general ranking for roadmap prediction and object detection.
- Developed an end-to-end approach to predict bird's-eye-view roadmaps and objects from multi-view images without camera calibration (fixed camera setup).
- Integrated feature pyramid networks and self-supervised learning, boosting mAP by 7.72% for roadmaps and 14.35% for detection.

## AWARDS AND HONORS

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IROS 2023 Workshop on Localization Scholarship

2023

Ernst Weber Fellowship, NYU

2023 – 2024

School of Engineering Fellowship, NYU

2022 – 2023

Excellence Award for Undergraduate Thesis, USTB

2019

## SKILLS

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<b>Programming:</b>	Python (advanced), C/C++.
<b>Machine/Deep Learning:</b>	PyTorch, PyTorch Lightning.
<b>Computer Vision:</b>	OpenCV, Kornia.
<b>DevOps &amp; HPC:</b>	Docker, Singularity, SLURM, etc.
<b>Languages:</b>	English (fluent), Mandarin (native).