

# JIUHONG XIAO

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## EDUCATION

<b>New York University</b> <i>Ph.D. in Electronic Engineering</i>	Sep 2022 - May 2027 GPA: 4.0/4.0
<b>New York University</b> <i>M.S. in Computer Science</i>	Jan 2020 - Dec 2021 GPA: 3.94/4.0
<b>University of Science and Technology Beijing</b> <i>B.Eng. in Intelligence Science and Technology</i>	Aug 2015 - Jun 2019 GPA: 3.65/4.0, Major GPA: 3.84/4.0

## RESEARCH INTERESTS

Computer Vision, Robotics, Visual Geo-localization, Image Retrieval

## PUBLICATIONS

<b>Visual Geo-localization with Self-supervised Representation Learning</b> <i>Jiuhong Xiao, Gao Zhu, Giuseppe Loianno</i> <i>Thirty-seventh Conference on Neural Information Processing Systems (Neurips) (2023), Submitted.</i>	2023
<b>Long-range UAV Thermal Geo-localization with Satellite Imagery</b> <i>Jiuhong Xiao, Daniel Tortei, Eloy Roura, Giuseppe Loianno</i> <i>IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) (2023), Accepted.</i>	2023
<b>Identity Preserving Loss for Learnt Image Compression</b> <i>Jiuhong Xiao, Lavisha Aggarwal, Prithviraj Banerjee, Manoj Aggarwal, Gerard Medioni</i> <i>Computer Vision and Pattern Recognition (CVPR) Workshops (2022), 517-526.</i>	2022
<b>Multi-Robot Collaborative Perception with Graph Neural Networks</b> <i>Yang Zhou, Jiuhong Xiao, Yue Zhou, Giuseppe Loianno</i> <i>IEEE Robotics and Automation Letters 7, no. 2 (2022), 2289-2296.</i>	2022
<b>Toward Coordination Control of Multiple Fish-Like Robots: Real-Time Vision-Based Pose Estimation and Tracking via Deep Neural Networks</b> <i>Tianhao Zhang, Jiuhong Xiao, Liang Li, Chen Wang, Guangming Xie</i> <i>IEEE/CAA Journal of Automatica Sinica 8, no. 12 (2021), 1964-1976.</i>	2021
<b>Image Encryption Algorithm Based on Memristive BAM Neural Networks</b> <i>Jiuhong Xiao, Weiping Wang, Meiqi Wang</i> <i>IEEE 3rd International Conference on Data Science in Cyberspace (2018), 205-212.</i>	2018
<b>The Stability of Memristive Multidirectional Associative Memory Neural Networks With Time-varying Delays in the Leakage Terms via Sampled-data Control</b> <i>Weiping Wang, Xin Yu, Xiong Luo, Long Wang, Lixiang Li, Juergen Kurths, Wenbing Zhao, Jiuhong Xiao</i> <i>PLOS ONE 13, no. 9 (2018), e0204002.</i>	2018

## EXPERIENCE

<b>Amazon</b> <i>Applied Scientist</i> <ul style="list-style-type: none"><li>• Worked in Amazon Go/Just walk out (JWO) technology.</li><li>• Built a multi-view occlusion detection system to reduce errors caused by unknown occluders.</li></ul>	Jan 2022 - Aug 2022
<b>New York University</b> <i>Graduate Teaching Assistant</i> <ul style="list-style-type: none"><li>• Supported Deep Learning course with 100+ students.</li><li>• Created the homework materials, graded assignments, and answered students' questions for homework and lectures.</li></ul>	Sep 2021 - Dec 2021
<b>Amazon</b> <i>Applied Scientist Intern</i> <ul style="list-style-type: none"><li>• Developed a VAE-based compression method specific to face images, achieving <b>5x</b> compression ratio of High Efficiency Video Coding (HEVC) format with acceptable image quality.</li></ul>	May 2021 - Aug 2021

- Jointly optimized compression model with face recognition downstream model, and reduced the file size to **27.4%** of HEVC with lower False Rejection Rate (FRR) under same False Acceptance Rate (FAR).

## New York University

May 2020 - May 2021

*Research Assistant (advised by Alfredo canziani, Yann LeCun)*

- Implemented an offline autonomous driving policy-training pipeline based on annotated lane maps with limited historical driving data.
- Designed the training strategy and specific loss functions to reduce lane annotation cost and improve the generalization performance of the policy for different lane layouts.
- Increased mean survival rate from 75% to **86%** compared to the baseline offline RL method to reduce collision and offroad crashes.

## Intelligent Biomimetic Design Laboratory, Peking University

Jun 2019 - Jan 2020

*Research Assistant (advised by Guangming Xie)*

- Implemented a fish pose estimation method fusing top-down and bottom-up paradigms, increasing mAP by **7.9%** and **10.9%** compared with classical methods using single paradigm.
- Developed a fish pose tracking system based on keypoint matching, reducing tracking error by **72.7%**.
- Built a robotic fish dataset with over **1,300** annotated frames as the benchmark for robotic fish pose estimation and the foundation of fish group control.

## SELECTED PROJECTS

### Autonomous Drone Inspection with Deep Reinforcement Learning

Sep 2021 - Dec 2021

*Advisors: Lerrel Pinto. New York University*

- Developed a reinforcement learning framework for real-life UAV autonomous inspection experiments with ROS.
- Analyzed the impact of different environment setups on inspection performance.

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

Jan 2020 - May 2020

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

- Won **2nd** place in the general ranking on roadmap prediction and object detection task.
- Built an end-to-end autonomous driving detection system to predict bird-view roadmap and objects from multi-view images without measurement of camera parameters.
- Improved model performance with feature pyramid network and self-supervised learning by **7.72%** mAP on roadmap and **14.35%** mAP on detection.

### A Survey of Bayesian Methods for Deep Learning

Jan 2020 - May 2020

*Advisor: Joan Bruna. New York University*

- Surveyed recent works that apply principles of Bayesian inference to deep learning and noted special applications of Bayesian deep learning.
- Implemented PyTorch version of Bayesian methods like SGLD, Deep Ensembles, and MCDropout.

## AWARDS AND GRANTS

IROS 2023 Workshop on Localization Scholarship	2023
Ernst Weber Fellowship, NYU	2023
School of Engineering Fellowship, NYU	2022-2023
Excellence Award for Undergraduate Thesis, USTB	2019
Peoples Scholarship, USTB	2015 - 2018
First Prize, Mathematical Modeling Competition, Beijing	2017

## SKILLS

<b>Programming</b>	C&C++, Python, Matlab.
<b>Platform/tools</b>	Opencv, Pytorch, CUDA.
<b>Languages</b>	English, Mandarin.