

Guangze Zheng

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EDUCATION

Tongji University, Shanghai, China

September, 2018 - June, 2022

BEng in Mechanical Engineering (mainly engaged in Computer Science5da)

- **Scholarship:** National Encouragement Scholarship (Year 2018, Year 2019, Year 2020), First Prize of Tongji Scholarship for excellence (Year 2018, Year 2019, Year 2020), Social Work Scholarship of Tongji University (Year 2018, Year 2019, Year 2020), and Tang Zhongying Public Service Scholarship (Year 2018-2022)
- **GPA:** 4.8/5.0 (equivalent to 93/100); **Ranking:** 4/118 (percentage ranking: 3.4%)
- **Supervisor:** Prof. Changhong Fu (Director of **Vision4Robotics Group**)

RESEARCH INTERESTS

Deep Learning, Robotics, Visual Object Tracking

PROJECTS

Real-Time and Robust Aerial Visual Tracking Method Development

November, 2019-Present

Research Assistant in Vision4Robotics Group

Supervisor: Prof. Changhong Fu

- Correlation filter-based methods for unmanned aerial vehicle (UAV) tracking
 - Proposed an assessment measure of tracking mutation in UAV tracking scenarios, namely mutation threat factor (MTF). An adaptive hybrid label with MTF adjustment was applied for filter training.
 - Designed a mutation sensitive correlation filter (MSCF) for UAV tracking. Exhaustive experiments conducted on authoritative UAV benchmarks verified its high efficiency.
- Siamese network-based methods for unmanned aerial manipulator (UAM) tracking
 - Introduced Siamese network to UAM tracking and proposed a scale-channel attention strategy. Designs a scale attention network and a scale-aware anchor proposal network to deal with severe object scale variation in UAM tracking.
 - Published a well-annotated UAMT100 benchmark to evaluate UAM tracking methods. Exhaustive experiments on two authoritative aerial tracking benchmarks, the UAMT100 benchmark, and real-world tests have proved its practicality.

Unmanned Aerial Manipulator Tracking System Building

July, 2021-August, 2021

Research Assistant in UAV Lab, Tsinghua University

Supervisor: Prof. Geng Lu

- UAM indoor flying system establishment and tracking benchmark recording
 - Used the OptiTrack Flex 13 camera from Quanser acquire to the pose information of UAM and reported it to the NVIDIA Xavier NX through ROS client nodes. The communication between onboard computer and Pixhawk 2.4.8 relied on serial. Besides, QGroundControl acted as the ground station.
 - On constructing UAMT100 benchmark, 16 kinds of objects were involved, and 11 attributes were annotated. Especially for UAM tracking, UAM attack and wind disturbance were considered. Please refer to <https://uamt100.netlify.app> for more details.

UAV Object Tracking in Low-Light Environment

November, 2020-Present

Research Assistant in Vision4Robotics Group

Supervisor: Prof. Changhong Fu

- CNN-based low-light image enhancement for UAV tracking
 - Designed a CNN-based lightweight low-light enhancement network, namely DarkLighter, for UAV object tracking in the dark environments.
 - Experiments are conducted with several SOTA trackers on numerous UAV dark tracking scenes, and the proposed methods satisfy the real-time speed on NVIDIA Jetson AGX Xavier.
- Transformer-based low-light image enhancement for UAV tracking
 - Proposed a spatial-channel Transformer-based network (SCT) and non-linear curve projection model for nighttime UAV tracking.
 - Collected a large-scale nighttime UAV tracking benchmark, DarkTrack2021. Evaluation on two UAV night-track benchmarks and real-world tests verified the efficiency of SCT.

Zeal Eco-Power Racing Vehicle Team

November, 2019-Present

Core Member of Electronic Control Group in Tongji Zeal Eco-Power

Supervisor: Prof. Diming Lou

- Development of the Embedded Equipment and Software for Racing Vehicles

- Improved the velocity measurement methods and automatic oil cut-off system for STM32 embedded on the Prototype Car. Upgraded the mobile Android application for vehicle state visualization and driver assistance.
- Our team won the Second Place, Technology Innovation Award, and Circular Economy Award in the Shell ECO-Marathon (SEM), China, 2020.

CONFERENCE PAPERS

[c1] **Guangze Zheng**, Changhong Fu*, Junjie Ye, Fuling Lin, and Fangqiang Ding. "Mutation Sensitive Correlation Filter for Real-Time UAV Tracking with Adaptive Hybrid Label" accepted by *IEEE International Conference on Robotics and Automation (ICRA)*, Xi'an, China, 2021. [[paper](#)] [[code](#)] [[demo](#)]

[c2] Junjie Ye, Changhong Fu*, **Guangze Zheng**, Zi'ang Cao, and Bowen Li. "DarkLighter: Light up the Darkness for UAV Tracking" submitted to *IEEE International Conference on Intelligent Robots and Systems (IROS)*, Prague, Czech Republic, 2021. [[paper](#)] [[code&demo](#)]

WORKING PAPERS

[i1] **Guangze Zheng**, Changhong Fu*, Junjie Ye, Bowen Li, Geng Lu, and Jia Pan. "Robust Siamese Object Tracking for Unmanned Aerial Manipulator" submitted to *IEEE International Conference on Robotics and Automation (ICRA)*, Philadelphia (PA), USA, 2022. [[code](#)] [[demo](#)] [[benchmark](#)]

[i2] Junjie Ye, Changhong Fu*, Zi'ang Cao, Shan An, **Guangze Zheng**, and Bowen Li. "Tracker Meets Night: A Transformer Enhancer for UAV Tracking" submitted to *IEEE Robotics and Automation Letters*, 2022. [[code&demo](#)]

SELECTED HONORS

★ National Encouragement Scholarship	December, 2019 & 2020 & 2021
★ First Prize of Tongji Scholarship for Excellence	December, 2019 & 2020 & 2021
★ Social Work Scholarship of Tongji University	December, 2019 & 2020 & 2021
★ Tang Zhongying Public Service Scholarship	December, 2019- June, 2022
★ Excellent Student Cadre of Tongji University	December, 2019 & 2020 & 2021
★ Third Prize in Shanghai Mechanics Competition	December, 2020
★ Third Prize of Tongji Undergraduate Physics Competition	October, 2019
★ Winner Prize of Public Speaking Contest 'Praise for Seventy Years & Be a Dreamer'	August, 2019

SERVICE

◆ Speaker for Aerial Robotics: Tracking topic, IEEE International Conference on Robotics and Automation (ICRA), Xi'an, China,	May, 2021
◆ Reviewer for IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)	April, 2021
◆ Class president of ME'18 Class B, top 10 'Excellent Academic Atmosphere Class' among all undergraduate classes in Tongji University	September, 2018-June, 2022
◆ Student Union Core Member in the School of Mechanical Engineering, Tongji University, and won the ' Student Union Star ' prize	September, 2018-June, 2019
◆ Tang Zhongying Public Welfare Promotion Association Member in Tongji University	November, 2019-Present
◆ Peer Academic Mentor in Tongji Academic Center	September, 2019-June, 2020

SKILLS

Programming	Python, Matlab, C/C++	EOS	NVIDIA Jetson series, STM32
Libraries	Pytorch, MAVROS	CAD	AutoCAD, Solidworks, etc.
English	TOEFL Best Score (104, 30R/23L/26S/25W)		