Ziang Cao

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Education

Tongji University Shanghai, China
B.Eng. in Vehicle Engineering *Sept, 2017 – June, 2022*

- **GPA Overall:** 4.81/5.0 (93/100)
- **Scholarship:** National Scholarship for undergraduate student (top 1%) × 3 (Year2017, Year2018, Year2019)
- **Advisor:** Prof. Changhong Fu (Director of Vision4Robotics Group)

Research Interests

Robotic Vision, Aerial Robotics, Deep Learning, Computer Vision, Multimodality

Research Experience

Investigating Real-time Deep Learning-based Visual Tracking Methods for UAV *May, 2020–Present*

- Propose a novel high-performance tracker based on anchor proposal network for UAV with a promising efficiency (**ICRA2021, Accepted**).
- Promote my previous method and deploy it on the aerial embedded platform which achieve impressive performance on real-world tests (**TGRS, Accepted**).
- Introduce the attention mechanism into our tracker for raising the discriminability of tracker (**IROS2021, Accepted**).
- Proposing a novel and efficient hierarchical transformer tracker for aerial tracking (**ICCV2021, Accepted**).

Developing effective image enhancement methods for round-the-clock aerial tracking *May, 2020–Present*

- Proposed an efficient and effective image enhancement for UAV tracking (**IROS2021, Accepted**).
- Develop a tracking-inspired enhancer for achieving robust enhancement result (**RA-L, Under review**).

Studying on the adversarial attack methods *March, 2021–Present*

- Propose a imperceptible attack method based on resampling against tracking (**ICRA2022, Under review**).

Research about action target prediction *June, 2021–Present*

- Create the first action target prediction benchmark and baseline (**NeurIPS 2021, Under review**).

Publication

Conference

- Changhong Fu, **Ziang Cao**, Yiming Li, Junjie Ye, and Chen Feng. *Siamese Anchor Proposal Network for High-Speed Aerial Tracking*, in IEEE International Conference on Robotics and Automation (**ICRA 2021, Accepted**).
- **Ziang Cao**,Changhong Fu, Junjie Ye, Bowen Li, and Yiming Li. *SiamAPN++: Siamese Attentional Aggregation Network for Real-Time UAV Tracking*, in IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS 2021, Accepted**).
- **Ziang Cao**,Changhong Fu, Junjie Ye, Bowen Li, and Yiming Li. *HiFT: Hierarchical Feature Transformer for Aerial Tracking*, in IEEE/CVF International Conference on Computer Vision (**ICCV 2021, Accepted**).
- Junjie Ye,Changhong Fu,Guangze Zheng, **Ziang Cao**, and Bowen Li. *DarkLighter: Light Up the Darkness for UAV Tracking*, in IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS 2021, Accepted**).
- Junjie Ye,Changhong Fu,**Ziang Cao**, Shan An, Guangze Zheng, and Bowen Li. *Tracker Meets Night: A Transformer Enhancer for UAV Tracking*, in IEEE Robotics and Automation Letters (**RA-L, Under review**).
- Changhong Fu,Sihang Li, Xinnan Yuan, Junjie Ye ,**Ziang Cao**, and Fangqiang Ding. *Ad^{2}Attack: Adaptive Adversarial Attack for Real-Time UAV Tracking*, in IEEE International Conference on Robotics and Automation (**ICRA 2022, Under review**).

- Yiming Li*,**Ziang Cao***,Andrew Liang, Benjamin Liang, Luoyao Chen, Hang Zhao, and Chen Feng. *Egocentric Prediction of Action Target in 3D*, in Annual Conference on Neural Information Processing Systems (**NeurIPS 2021, Under review**) *Equal contribution.

Journal

- Changhong Fu, **Ziang Cao**, Yiming Li, Junjie Ye, and Chen Feng. *Siamese Anchor Proposal Network for High-Speed Aerial Tracking*, in IEEE Transactions on Geoscience and Remote Sensing (**TGRS, Accept**).

Selected Project

Zeal Eco-Power Racing Vehicle Team (Tongji University) *Oct 2018 – Present*

- Design novel mechanical structure and retrofit the existing engine to make it light.
- Ameliorate the Gasoline Direct Injection (GDI) engine for reducing fuel consumption further (Student Innovation Training Program, SITP).
- Optimize the control parameters of EFI system to make the injected gasoline fully burn.
- Conduct the detailed acceleration strategy and emergency protection measures for handling special situations.

Award

First Prize of Honda China ECO-Mileage Challenge	2019.11
First Prize of Tongji Undergraduate Mathematics Competition	2018.7
Second Prize of Chinese Undergraduate Mathematics Competition	2018.11
Second Prize of Shanghai Undergraduate Mathematics Competition	2018.11
First Prize of Shanghai Advanced mapping technology and innovative design competition	2019.6
First Prize of Shanghai Undergraduate Engineering Comprehensive Ability Competition	2018.12
Excellent Student Award in Tongji University	2019.1
Third Prize of Tongji Undergraduate General Physics Competition	2018.6
National Scholarship for undergraduate students	2018.11
National Scholarship for undergraduate students	2019.12
National Scholarship for undergraduate students	2020.12
Star of research innovation, School of automotive studies, Tongji University	2020.12

Key Skills

Languages: English, French
Programming: C/C++, Python, Matlab
Tools: Latex, AutoCAD, Solidworks, Autodesk Inventor, Vscode