

# YIMING LI

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## EDUCATION

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- **Tongji University, Shanghai, China** 2015.9 - present  
B.Eng. in Mechanical Engineering GPA Overall: 90.0/100, Major: 92.9/100
  - Supervisor: Prof. Changhong Fu (Director of Vision4Robotics Group)
  - Scholarship: Shanghai Scholarship, National Scholarship, National Endeavor Scholarship, Excellent Student Scholarship, School Practice Scholarship.
- **Tsinghua University, Beijing, China** 2019.9 - present  
Visiting Student in Department of Automation
  - Supervisor: Prof. Geng Lu (Director of UAV Lab)

## RESEARCH INTERESTS

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- Robot Vision, Aerial Robotics, Machine Learning, Visual Tracking, Pose Estimation (*present*)
- Semantic Analytics, 3D and 4D Vision, Multi-Robot System, Multi-Sensor Fusion (*future*)

## RESEARCH EXPERIENCES

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### Developing Robust and Real-Time Aerial Tracking Algorithms on CPU 2018.7 - present

- Proposed automatic spatial-temporal regularized correlation filter. (current work for CVPR 2020)
- Repressed the response variation of background-aware correlation filter. (published in ICCV 2019)
- Incorporated memory augmentation to tackle filter corruption issues. (submitted to ICRA 2020)
- Exploited the part-based method to deal with partial appearance variation. (under revision)
- Fused multiple features to construct robust representation. (published in *Remote Sensing*)

### Investigating Deep Learning-based Visual Tracking for UAV 2019.3 - present

- Exploited the keyframe technique and proposed a keyfilter-aware tracker for mitigating filter corruptions and lowering the redundancy of context learning; Utilized lightweight convolution features to efficiently and effectively raise the tracking robustness. (submitted to ICRA 2020)
- Explored the multi-frame strategy and developed the multi-frame consensus verification for achieving long-term tracking; Fused features from different layers of CNN including both spatial and semantic information to achieve accurate tracking. (published in IROS 2019)
- Designed a collaborative multi-recommender scheme to unlock CNN's potential. (under revision)

### Localization by Tracking: A Monocular Pose Estimation System 2019.7 - present

- Developed fast trackers on C++ platform to track the markers observed by a moving camera.
- Developed a monocular pose estimation system with high flexibility and generality.
- Tested the monocular localization system in ROS Gazebo and validated it on quanser platform.

## SELECTED PROJECTS

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### UAV-loaded Serpentine Manipulator for Search and Rescue 2018.5 - 2018.7

- Designed the overall structure of separable UAV-loaded Serpentine Manipulator.
- Finished writing the specification and submitted the National Patent for Invention application.

### Structure Design for Drone's Wireless Charging 2018.5 - 2018.7

- Conducted the overall structure design of a 3-DOF wireless charging facility for drones.
- Enhanced the accuracy when the drone approached the ground with imprecise poses.

### ZEAL Eco-Power Racing Vehicle Team 2016.10 - 2019.10

- Committed to designing and manufacturing Eco-Power car, specifically the control system.
- Designed velocity sensor, SD data logger and automatic throttle controller using ARM Cortex-M.

### Design of a Hiking Assistance Device 2016.7 - 2017.7

- Completed the overall structure design of the light-weight hiking assistance foldable drone.
- Applied the finite element analysis (FEA) methods to check the strength of all stressed parts.

## PUBLICATIONS

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### Journals:

- Changhong Fu, Fuling Lin, **Yiming Li**, Guang Chen. *Correlation Filter-Based Visual Tracking for UAV with Online Multi-Feature Learning*, *Remote Sensing* 11.5 (2019): 549.
- **Yiming Li**, Changhong Fu, Ziyuan Huang, Yinqiang Zhang, Jia Pan. *Intermittent Contextual Learning for Keyfilter-Aware UAV Object Tracking Using Deep Convolutional Feature*, submitted to *IEEE Transactions on Multimedia*, 2019 (Under review).

### Conferences:

- Changhong Fu, Ziyuan Huang, **Yiming Li**, Ran Duan, Peng Lu. *Boundary Effect-Aware Visual Tracking for UAV with Online Enhanced Background Learning and Multi-Frame Consensus Verification*, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2019.
- Ziyuan Huang, Changhong Fu, **Yiming Li**, Fulin Lin, Peng Lu. *Learning Aberrance Repressed Correlation Filters for Real-Time UAV Tracking*, IEEE International Conference on Computer Vision (ICCV), 2019.
- **Yiming Li**, Changhong Fu, Fangqiang Ding, Ziyuan Huang, Jia Pan. *Augmented Memory for Correlation Filters in Real-time UAV Tracking*, IEEE International Conference on Robotics and Automation (ICRA), 2020 (Under review).
- **Yiming Li**, Changhong Fu, Ziyuan Huang, Yinqiang Zhang, Jia Pan. *Keyfilter-Aware Real-Time UAV Object Tracking*, IEEE International Conference on Robotics and Automation (ICRA), 2020 (Under review).
- Yujie He, Changhong Fu, Fuling Lin, **Yiming Li**, Peng Lu. *Tri-Attention Correlation Filter for Effective UAV Object Tracking*, IEEE International Conference on Robotics and Automation (ICRA), 2020 (Under review).

- Fan Li, Changhong Fu, Fuling Lin, **Yiming Li**, Peng Lu. *Training-set Distillation for Real-Time UAV Object Tracking*, IEEE International Conference on Robotics and Automation (ICRA), 2020 (Under review).

## AWARDS

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Model of Outstanding Students in Tongji university (0.15 %)	2019.1
Second Prize of the National College Student Innovation and Entrepreneurship Competition	2018.11
First Prize of the 3rd Shanghai Mechanics Competition	2018.6
First Prize of the 8th Shanghai Innovation Design Competition	2018.5
Meritorious Winner in 2018 Mathematics Contest in Modeling	2018.3
Champion of 2017 Honda Eco Mileage Challenge (GS Group)	2017.10

## SERVICE

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Reviewer: IEEE International Conference on Advanced Robotics and Mechatronics (ARM), 2019

## KEY SKILLS

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**Language:** English: TOEFL 105(R29,L27,S24,W25), GRE(V156+Q168+W4); German(B1).

**Programming:** C/C++, Python, Matlab.

**Tools:** Robot Operating System (ROS), Latex.