YIMING LI

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EDUCATION

- **Tongji University, Shanghai, China** *2015.9 - 2020.6(expected)*
  B.Eng. in Mechanical Engineering

  - GPA Overall: *3.77/4.0* (equivalent to *90/100*)

  - GPA Major: *3.91/4.0* (equivalent to *92/100*)

  - Supervisor: Prof. Changhong Fu (Director of Vision4Robotics Group)

  - Scholarship: National Scholarship (top 1%), Shanghai Scholarship (top 1%), National Endeavor Scholarship, Excellent Student Scholarship, School Practice Scholarship.

- **Tsinghua University, Beijing, China** *2019.9 - 2019.10*
  Visiting Student in Department of Automation

  - Supervisor: Prof. Geng Lu (Director of UAV Lab)

- **Taiyuan No.5 Middle School, Taiyuan, China** *2012.9 - 2015.6*

RESEARCH INTERESTS

- Robot Vision and Learning, Aerial Robotics, Visual Tracking, Pose Estimation

- Semantic Analytics, 3D and 4D Vision, Multi-Robot System, Multi-Model Perception

RESEARCH EXPERIENCES

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

- Proposed a general automatic spatio-temporal regularization method. *(submitted to CVPR 2020)*

- Incorporated memory augmentation to tackle filter corruption issues. *(preparation for IROS 2020)*

- Proposed to repress the aberrance in correlation filter framework. *(published in ICCV 2019)*

- 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. *(accepted by ICRA 2020)*

- Explored the multi-frame strategy and developed the multi-frame consensus verification for achieving long-term tracking. Fused features form 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 versatility and accuracy.

- Tested the monocular localization system in ROS Gazebo and validated it on quanser platform.

SELECTED PROJECTS

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

(* highlights my supervisor. My contributions in the third author-papers are proposing ideas, conducting experiments as well as revising papers, and in the fourth author-papers are revising papers.)

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*, IEEE Transactions on Multimedia, 2019. Accepted.

- Changhong Fu*, Ziyuan Huang, **Yiming Li**, Ran Duan, Peng Lu. *Online Enhanced Background Learning for Boundary Effect-Aware Visual Tracking for UAV with Consensus Verification*, IEEE Transactions on Knowledge and Data Engineering, 2019. Under preparation.

Conferences:

- Ziyuan Huang, Changhong Fu*, **Yiming Li**, Fulin Lin, Peng Lu. *Learning Aberrance Repressed Correlation Filters for Real-Time UAV Tracking*, in IEEE International Conference on Computer Vision (**ICCV'19**), Seoul, Korea, Oct. 2019.

- 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*, in IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS'19**), Macau, China, Nov. 2019.

- **Yiming Li**, Changhong Fu*, Ziyuan Huang, Yinqiang Zhang, Jia Pan. *Keyfilter-Aware Real-Time UAV Object Tracking*, in IEEE International Conference on Robotics and Automation (**ICRA'20**). Accepted.

- Fan Li, Changhong Fu*, Fuling Lin, **Yiming Li**, Peng Lu. *Training-set Distillation for Real-Time UAV Object Tracking*, in IEEE International Conference on Robotics and Automation (**ICRA'20**). Accepted.

- **Yiming Li**, etal. *Automatic Spatio-Temporal Regularization: A General Approach in Correlation Filters for Fast UAV Tracking*, in IEEE Conference on Computer Vision and Pattern Recognition (**CVPR'20**). Under rebuttal [1].

- **Yiming Li**, Changhong Fu*, Fangqiang Ding, Ziyuan Huang, Jia Pan. *Augmented Memory for Correlation Filters in Real-time UAV Tracking*, in IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS'20**). Under preparation.

- Yujie He, Changhong Fu*, Fuling Lin, **Yiming Li**, Peng Lu. *Tri-Attention Correlation Filter for Effective UAV Object Tracking*, in IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS'20**). Under preparation.

AWARDS

- Top 10 Undergraduate Researchers in Tongji University[2] *2019.12*
- Model of Outstanding Students in Tongji University (0.15 %) *2019.1*
- Second Prize of National Undergraduate 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*
- Third Prize of China Undergraduate Mathematical Competition in Modeling *2017.10*
- Second Prize of Tongji Undergraduate Mathematical Competition in Modeling *2017.5*
- Third Prize of Tongji Undergraduate General Physics Competition *2016.5*

SERVICE

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

KEY SKILLS

Language: English: TOEFL **105**(R29,L27,S24,W25), GRE **324**(V156+Q168+AW4.0); German(B1).
Programming: C/C++, Python, Matlab.
Tools: Robot Operating System, LaTex, Autodesk Inventor, Adobe After Effects, Adobe Premiere.

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[1]The pre-rebuttal paper rating from three reviewers: three weak accept
[2]10 out of 35 candidates from 18,115 undergraduate students