

# Fangqiang Ding

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Room 3.20, Bayes Centre, 47 Potterrow, Edinburgh, United Kingdom

## EDUCATION

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| <b>University of Edinburgh</b><br><i>PhD Student in Robotics and Autonomous Systems</i>  | Edinburgh, UK<br>2021/09 - Present   |
| <ul style="list-style-type: none"><li>• Supervisor: <a href="#">Dr. Chris Xiaoxuan Lu</a> (Associate Professor @ University College London)</li><li>• Scholarship: <a href="#">EPSRC CDT-RAS PhD Fellowship</a></li></ul>  |                                      |
| <b>Tsinghua University</b><br><i>Visiting Student</i>  | Beijing, China<br>2020/08 - 2020/09  |
| <ul style="list-style-type: none"><li>• Advisor: <a href="#">Dr. Geng Lu</a> (Associate Professor @ Department of Automation)</li></ul>  |                                      |
| <b>Tongji University</b><br><i>BEng in Mechanical Engineering</i>  | Shanghai, China<br>2017/09 - 2021/07 |
| <ul style="list-style-type: none"><li>• GPA: 4.73/5.0 (equivalent to 92.3/100, ranking: 2/130)</li><li>• Scholarship: 2 × <b>National Scholarship</b> (top 1%, Year 2017-8 &amp; 2018-9)</li><li>• Award: <b>Academic Stars</b> in Tongji (top 10 from all undergraduates)</li><li>• Supervisor: <a href="#">Dr. Changhong Fu</a> (Associate Professor @ School of Mechanical Engineering)</li></ul> |                                      |

## RESEARCH INTERESTS

4D Automotive Radar, Autonomous Driving, Mobile Robotics, Embodied AI, VR/AR

## RESEARCH EXPERIENCE

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| <b>MAPS Lab, University of Edinburgh</b><br><i>PhD Student, Supervisor: <a href="#">Dr. Chris Xiaoxuan Lu</a></i>   | Edinburgh, UK<br>2021/09 - Present   |
| <ul style="list-style-type: none"><li>• <b>4D Automotive Radar-enabled Mobile Autonomy</b><ul style="list-style-type: none"><li>– Exploit multi-level 4D radar data representation, e.g., radar tensor and point cloud, to improve the perception redundancy, robustness and efficiency onboard autonomous vehicles.</li><li>– Develop bespoke algorithms to support various 4D radar-based tasks, e.g., moving object detection, segmentation and tracking, 3D occupancy prediction, scene flow estimation and odometry.</li></ul></li><li>• <b>Privacy-aware Human Behaviour Recognition</b><ul style="list-style-type: none"><li>– Enhance the performance of mmWave-based human sensing tasks, e.g., activity recognition, human parsing and body part tracking by learning scene flow estimation on imaging radar point clouds.</li><li>– Build a complete benchmark for human body reconstruction from different types of mmWave data representations, i.e., ADC samples, radar tensor and radar point cloud.</li></ul></li><li>• <b>Egocentric Hand Pose and Action Analysis with Thermal Image</b><ul style="list-style-type: none"><li>– Investigate using thermal images for first-person two-hand pose estimation and action recognition.</li><li>– Develop a benchmark for the above task and evaluate state-of-the-art RGB(D) image-based methods.</li></ul></li></ul> |                                      |
| <b>UAV Lab, Tsinghua University</b><br><i>Visiting Student, Advisor: <a href="#">Dr. Geng Lu</a></i>  | Beijing, China<br>2020/08 - 2020/09  |
| <ul style="list-style-type: none"><li>• <b>Monocular UAV Indoor Self-Localization</b><ul style="list-style-type: none"><li>– Apply visual object trackers to UAV indoor self-localization under air-ground robot coordination.</li></ul></li></ul>  |                                      |
| <b>Vision4Robotics Group, Tongji University</b><br><i>Research Student, Supervisor: <a href="#">Dr. Changhong Fu</a></i>  | Shanghai, China<br>2019/05 - 2021/06 |
| <ul style="list-style-type: none"><li>• <b>Efficient and Robust UAV Visual Object Tracking</b><ul style="list-style-type: none"><li>– Present novel algorithms to solve task-specific issues in UAV visual object tracking, such as background distractor, temporal discontinuity, adversarial attack, and darkness, without sacrificing the real-time performance on CPUs by using correlation filter-based approaches.</li></ul></li></ul>  |                                      |

## FEATURED PAPERS (\* indicates equal contribution.)

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[p1] **Fangqiang Ding\***, Zhijun Pan\*, Haotao Zhong\*, Chris Xiaoxuan Lu. "Moving Object Detection and Tracking with 4D Radar Point Cloud" accepted by *ICRA*, 2024. [[paper](#)]

[p2] **Fangqiang Ding**, Zhen Luo, Peijun Zhao, Chris Xiaoxuan Lu. "milliFlow: Scene Flow Estimation on mmWave Radar Point Cloud for Human Motion Sensing" in submission to top-tier conference, 2024. [[paper](#)]

- [p3] **Fangqiang Ding**, Andras Palffy, Dariu M. Gavrilă, Chris Xiaoxuan Lu. "Hidden Gems: 4D Radar Scene Flow Learning Using Cross-Modal Supervision" in *CVPR*, 2023 (top 10% **Highlight**). [[paper](#)] [[code](#)]
- [p4] **Fangqiang Ding**, Zhijun Pan, Yimin Deng, Jianning Deng, Chris Xiaoxuan Lu. "Self-Supervised Scene Flow Estimation with 4-D Automotive Radar". *IEEE RAL with IROS presentation*, 2022. [[paper](#)] [[code](#)]
- [p5] Bowen Li, Changhong Fu, **Fangqiang Ding**, Junjie Ye, Fuling Lin. "All-Day Object Tracking for Unmanned Aerial Vehicle". *IEEE TMC*, 2022. [[paper](#)] [[code](#)]
- [p6] **Fangqiang Ding**, Changhong Fu, Yiming Li, Jin Jin and Chen Feng. "Automatic Failure Recovery and Re-Initialization for Online UAV Tracking with Joint Scale and Aspect Ratio Optimization" in *IROS*, 2020. [[paper](#)] [[code](#)]
- [p7] Yiming Li, Changhong Fu, **Fangqiang Ding**, Ziyuan Huang and Geng Lu. "AutoTrack: Towards High-Performance Visual Tracking for UAV with Automatic Spatio-Temporal Regularization" in *CVPR*, 2020. [[paper](#)] [[code](#)]

## SELECTED AWARDS

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<b>ESPRC CDT-RAS PhD Scholarship</b>	<i>Sept. 2021</i>
<b>Grand Prize of "Challenge Cup" in Shanghai</b>	<i>June 2021</i>
<b>Excellent Graduate of Shanghai (top 2%)</b>	<i>May 2021</i>
<b>Academic Stars in Tongji (top 10)</b>	<i>Nov. 2020</i>
<b>China National Scholarship (top 1%)</b>	<i>Sept. 2019</i>
<b>China National Scholarship (top 1%)</b>	<i>Sept. 2018</i>
<b>First Prize of Tongji Mathematics Competition</b>	<i>June 2018</i>
<b>First Prize of Shanghai Graphics Design Competition</b>	<i>May 2018</i>

## ACADEMIC SERVICES

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- **Invited Reviewer** for ECCV, IEEE RA-L, IROS, ICRA, IEEE TII, ACM TOSN, TIV, etc.
- **Teaching Support** for *Introduction to Mobile Robotics* (2021-2024) (University of Edinburgh)
- **Advisor of Bachelor/Master thesis** for Nout Cleef (BSc. 2022), Xuanyu Pan (MSc. 2022), Zhijun Pan (BSc., 2023), Zhen Luo (MRes., 2023), Xinyuan Cui (BEng. 2024), Lawrence Zhu (BSc. 2024), Xiangyu Wen (MRes., 2024)