

# Fangqiang Ding

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G.12, Informatics Forum, 10 Crichton St, Edinburgh, United Kingdom

## EDUCATION

### The University of Edinburgh

PhD Student in Robotics and Autonomous Systems

Edinburgh, UK

09/2021 - 06/2025

- Supervisor: [Dr. Chris Xiaoxuan Lu](#) (Associate Professor @ UCL) and [Prof. Barbara Webb](#) (Professor @ UoE)
- Scholarship: [EPSRC CDT-RAS PhD Fellowship - Overseas](#)
- Thesis: Robust Spatial Perception with 4D Radar for Mobile Autonomy

### Tongji University

BEng in Mechanical and Automation Engineering

Shanghai, China

09/2017 - 07/2021

- GPA: 4.73/5.0 (equivalent to 92.3/100, ranking: 2/130)
- Scholarship: 2 × **National Scholarship** (top 1%, Year 2017-8 & 2018-9)
- Award: **Academic Stars** in Tongji (top 10 from all undergraduates) and **Shanghai Excellent Graduate**
- Supervisor: [Dr. Changhong Fu](#) (Associate Professor @ School of Mechanical Engineering)

## RESEARCH INTERESTS

My research focuses on advancing the robustness, efficiency, and privacy-awareness of perception systems for **Physical AI**. These efforts support autonomous systems like mobile robots, self-driving cars, AIoT and xR-integrated systems, aiming to facilitate their **widespread, long-horizon and non-intrusive** deployment.

## RESEARCH EXPERIENCE

### The 77 Lab, MIT

Postdoctoral Associate, advisor: [Dr. Hermano Igo Krebs](#)

Cambridge, USA

09/2025 (Expected)

#### • Lab's Research Directions

- We sit at the crossroads of mechanical engineering and design, computer science and control, and neuroscience and human factors. Human-Robot Interactions, Mechatronic Systems, Computer Vision, Adaptive Control Algorithms Human Factors.

### LIT-Lab, Technion

Postdoctoral Fellow, advisor: [Dr. Or Litany](#)

Remote

05/2025 - Present

#### • Data-Driven Radar Data Generation Conditioned on Images

- Design a scalable image-conditioned generative framework for synthesizing 4D radar point clouds, enabling large-scale multi-modal training and improved generalization. Pretrained latent diffusion models are fine-tuned to generate high-fidelity radar representations from RGB inputs.

### MAPS Lab, University of Edinburgh

PhD Student, Supervisor: [Dr. Chris Xiaoxuan Lu](#)

Edinburgh, UK

09/2021 - 05/2025

#### • Robust Spatial Perception for Mobile Autonomy in the Wild

- **Motion estimation:** realize scene flow learning on 4D radar points without human annotations. Extract and combine *self- and cross-modal* (e.g., LiDAR, camera, GPS/INS) *supervision* signals to constrain outputs from bespoke designed *multi-task* models, enabling motion estimation for *scene dynamics* (i.e., scene flow estimation, motion segmentation) and *ego-vehicle* (i.e., odometry).
- **Object detection/tracking:** propose the first joint moving object detection and tracking end-to-end trainable framework tailored for 4D radar point clouds. Moving objects are represented as *class-agnostic point clusters* to bypass the reliance on specific object type and bounding boxes.
- **3D occupancy prediction:** design the pioneering method for 4D imaging radar-based 3D occupancy perception. Advocate the usage of *4D radar tensor (4DRT)* to avoid the loss of negligible signal returns. Present tailored solutions to cope with the large, noisy and spherical 4DRTs.

#### • Privacy-aware Fine-grained Human Motion Sensing and Reconstruction

- **Sensing:** enhance the performance of downstream tasks, e.g., activity recognition, human parsing and body part tracking, by learning *scene flow estimation* on imaging radar point clouds.
- **Reconstruction:** collect a large-scale dataset consisting of *multi-level mmWave radar data*, RGB-D images, human body mesh and keypoints, and aim to build a complete benchmark.

#### • Robust 3D Hand Pose Estimation against Challenging Conditions

- Investigate using *thermal imaging* for egocentric 3D pose estimation to overcome challenges like *varying lighting conditions and obstructions* (e.g., handwear) in xR applications. Develop a benchmark consisting of multi-view and multi-spectral data with 3D hand poses annotations, a novel transformer-based network, and cross-spectrum evaluation results under different scenarios.

**UAV Lab, Tsinghua University**

Visiting Student, Advisor: [Dr. Geng Lu](#)

Beijing, China  
08/2020 - 09/2020

- **Monocular UAV Indoor Self-Localization**

- Apply visual object trackers to UAV indoor self-localization under air-ground robot coordination.

**Vision4Robotics Group, Tongji University**

Research Student, Supervisor: [Dr. Changhong Fu](#)

Shanghai, China  
05/2019 - 06/2021

- **Efficient and Robust UAV Visual Object Tracking**

- 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.

## SELECTED PUBLICATION (\* indicates corresponding author)

[p1] **Fangqiang Ding**, Yunzhou Zhu, Xiangyu Wen, Chris Xiaoxuan Lu\*. "ThermoHands: A Benchmark for 3D Hand Pose Estimation from Egocentric Thermal Images" in *ACM Sensys*, 2025. [[paper](#)] [[code](#)]

[p2] **Fangqiang Ding**, Xiangyu Wen, Yunzhou Zhu, Yiming Li, Chris Xiaoxuan Lu\*. "RadarOcc: Robust 3D Occupancy Prediction with 4D Imaging Radar" in *NeurIPS*, 2024. [[paper](#)] [[code](#)]

[p3] **Fangqiang Ding**, Zhen Luo, Peijun Zhao, Chris Xiaoxuan Lu\*. "milliFlow: Scene Flow Estimation on mmWave Radar Point Cloud for Human Motion Sensing" in *ECCV*, 2024. [[paper](#)] [[code](#)]

[p4] Zhijun Pan, **Fangqiang Ding**, Haotao Zhong, Chris Xiaoxuan Lu\*. "RaTrack: Moving Object Detection and Tracking with 4D Radar Point Cloud" in *ICRA*, 2024. [[paper](#)] [[code](#)] (co-first author)

[p5] **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](#)]

[p6] **Fangqiang Ding**, Zhijun Pan, Yimin Deng, Jianning Deng, Chris Xiaoxuan Lu\*. "Self-Supervised Scene Flow Estimation with 4-D Automotive Radar". *IEEE RA-L*, 2022. [[paper](#)] [[code](#)]

[p7] **Fangqiang Ding**, Changhong Fu\*, Yiming Li, Jin Jin, Chen Feng. "Automatic Failure Recovery and Re-Init. for Online UAV Tracking with Joint Scale and Aspect Ratio Optim." in *IROS*, 2020. [[paper](#)] [[code](#)]

## SELECTED AWARDS

RSS Pioneers 2025 (33 out of 226 applicants)	April. 2025
ESPRC CDT-RAS PhD Scholarship	Sept. 2021
Grand Prize of "Challenge Cup" in Shanghai	June 2021
Excellent Graduate of Shanghai (top 2%)	May 2021
Academic Stars in Tongji (top 10)	Nov. 2020
China National Scholarship (top 1%)	Sept. 2019
China National Scholarship (top 1%)	Sept. 2018
First Prize of Tongji Mathematics Competition	June 2018
First Prize of Shanghai Graphics Design Competition	May 2018

## ACADEMIC SERVICES

- **Associate Editor (AE)** for IROS 2025.
- **Invited Reviewer** for ICCV, CVPR, ECCV, RSS, ICRA, IROS, NeurIPS, ICML, ICLR, T-RO, IJRR, RA-L, etc.
- **Teaching Support** for *Introduction to Mobile Robotics* (2021-2024) (University of Edinburgh)
- **Advisor/Co-supervisor of Bachelor/Master thesis** for Nout Cleef (BSc. 2022, UoE), Xuanyu Pan (MSc. 2022, UoE), Zhijun Pan (BSc., 2023, UoE), Zhen Luo (MRes., 2023, UoE), Xinyuan Cui (BEng. 2024, UoE), Lawrence Zhu (BSc. 2024, UoE), Xiangyu Wen (MRes., 2024, UoE), Yunfan Shi (MSc. 2024, UCL), Ruihong Li (MSc. 2024, UCL), Yichun Xiao (BSc., 2025, UoE), Ryan Kwok (BSc., 2025, UoE).