

# Binbin Xu

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## Education

- Sep 2017– **PhD, Department of Computing, Imperial College London.**  
April 2022 PhD thesis: Object-level Dynamic SLAM  
Supervisors Dr. Stefan Leutenegger and Prof. Andrew Davison  
April 2015– **M.Eng., Precision Engineering, University of Tokyo.**  
March 2017 Graduated with 4.0/4.0 GPA and Outstanding Master's Thesis Award  
Thesis Optical Flow-based Video Completion for a Moving Spherical Camera  
Supervisors Prof. Atsushi Yamashita and Prof. Hajime Asama  
2010–2014 **B.Eng., Information Engineering, South China University of Technology.**  
GPA 88.07/100 (Ranking: TOP 6%)

## Experience

- Sep. 2022– **Postdoctoral Fellow**, Institute for Aerospace Studies, University of Toronto.  
Present Supervisor: Prof. Timothy D. Barfoot  
Sep 2020– **Research Intern**, Surreal Vision Team, Facebook Reality Labs Research.  
Dec. 2020 Mentors: Dr. Lingni Ma, Dr. Steven Lovegrove  
May – Aug. **Participant Student**, OpenCV in Google Summer of Code.  
2017 Mentor: Dr. Gary Bradski  
Sep. 2014 – **Research Student**, Department of Precision Engineering, University of Tokyo.  
March 2015 Supervisors: Prof. Atsushi Yamashita and Prof. Hajime Asama

## Publications

Google Scholar; [\*]: equal contribution

- IROS 2023 Christopher Choi, **Binbin Xu**, Stefan Leutenegger: *Accurate and Interactive Visual-Inertial Sensor Calibration with Next-Best-View and Next-Best-Trajectory Suggestion*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2023
- IROS 2023 Yuxuan Chen, **Binbin Xu**, Frederike Dümbs, Timothy Barfoot: *What to Learn: Features, Image Transformations, or Both?* IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2023
- RA-L 2023 & IROS 2023 Xingxing Zuo, Nan Yang, Nathaniel Merrill, **Binbin Xu**, Stefan Leutenegger: *Incremental Dense Reconstruction from Monocular Video with Guided Sparse Feature Volume Fusion*. IEEE Robotics and Automation Letters, Vol. 8, No. 6, pp. 3876-3883, 2023
- ICRA 2023 Sotiris Papatheodorou, Nils Funk, Dimos Tzoumanikas, Christopher Choi, **Binbin Xu**, Stefan Leutenegger: *Finding Things in the Unknown: Semantic Object-Centric Exploration with an MAV*. IEEE International Conference on Robotics and Automation (ICRA), 2023
- IROS 2022 **Binbin Xu**, Andrew J. Davison, Stefan Leutenegger: *Learning to Complete Object Shapes for Object-level Mapping in Dynamic Scenes*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022
- IROS 2022 Yifei Ren\*, **Binbin Xu**\*, Christopher Choi, Stefan Leutenegger: *Visual-Inertial Multi-Instance Dynamic SLAM with Object-level Relocalisation*. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2022

- arXiv 2021 **Binbin Xu\***, Lingni Ma\*, Yuting Ye, Tanner Schmidt, Chris Twigg, Steven Lovegrove: *DiForm: Identity-Disentangled Neural Deformation Model for Dynamic Meshes*. arXiv:2109.15299
- RA-L 2021 & ICRA2021 **Binbin Xu**, Andrew J. Davison, Stefan Leutenegger: *Deep Probabilistic Feature-metric Tracking*. IEEE Robotics and Automation Letters (RA-L), Vol. 6, No. 1, pp. 223-230, 2021 (presented at ICRA 2021) **Honorable Mention of RA-L 2021 Best Paper Award**
- ICRA 2019 **Binbin Xu**, Wenbin Li, Dimos Tzoumanikas, Michael Bloesch, Andrew Davison, Stefan Leutenegger: *MID-Fusion: Octree-based Object-Level Multi-Instance Dynamic SLAM*. IEEE International Conference on Robotics and Automation (ICRA), 2019
- RA-L 2017 **Binbin Xu**, Sarthak Pathak, Hiromitsu Fujii, Atsushi Yamashita, Hajime Asama: *Spatio-temporal Video Completion in Spherical Image Sequences*. IEEE Robotics and Automation Letters, Vol. 2, No. 4, pp. 2032-2039, 2017
- ROBIO 2016 **Binbin Xu**, Sarthak Pathak, Hiromitsu Fujii, Atsushi Yamashita, Hajime Asama: *Optical Flow-based Video Completion in Spherical Image Sequences*. IEEE International Conference on Robotics and Biomimetics, pp.388-395, 2016
- ICAM 2015 **Binbin Xu**, Sarthak Pathak, Hiromitsu Fujii, Atsushi Yamashita, Hajime Asama: *Robot Body Occlusion Removal in Omnidirectional Video Using Color and Shape Information*. JSME/RMD International Conference on Advanced Mechatronics, pp.49-50, 2015 (**Best Paper Honorable Mention Award**)
- ROBIO 2013 Ningjia Yang, Feng Duan, Yudi Wei, Chuang Liu, Jeffrey Too Chuan Tan, **Binbin Xu**, Jin Zhang: *A study of the human-robot synchronous control system based on skeletal tracking technology*. IEEE International Conference on Robotics and Biomimetics, pp.2191-2196, 2013
- ROBIO 2012 Wenyu Li, Feng Duan, Bo Chen, Jing Yuan, Jeffrey Too Chuan Tan, **Binbin Xu**: *Mobile robot action based on QR code identification*. IEEE International Conference on Robotics and Biomimetics, pp.860-865, 2012
- ROBIO 2012 Ningjia Yang, Feng Duan, Sicen Liu, Lili Dai, Jeffrey Too Chuan Tan, **Binbin Xu**: *Ankle-angle analysis of drop-foot patients in walking with FES*. IEEE International Conference on Robotics and Biomimetics, pp.831-836, 2012

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## Honors & Awards

- 2021 **Best Paper Honorable Mention**, IEEE Robotics and Automation Letters 2021
- 2017–2021 **Imperial College London PhD Scholarship**
- 2017 **Outstanding Master's Thesis Award**, Department of Precision Engineering, University of Tokyo
- 2016 **JSME Fellow Award for Outstanding Young Engineers**, The Japan Society of Mechanical Engineers (JSME)
- 2016 - 2017 **Monbukagakusho Honors Scholarship for Privately-Financed International Students**, Japan Student Services Organization (JASSO)
- 2015 **Best Paper Honorable Mention**, 2015 JSME/RMD International Conference on Advanced Mechatronics (ICAM 2015)

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## Skills

- Programming C++, Python, Pytorch, CUDA, ROS, MATLAB with practical experiences.
- Language Mandarin Chinese (Native), English (Proficiency), Japanese (JLPT N1)

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## Professional Activities

- Conf. review ICRA: 2019-2023; IROS: 2018-2023; CoRL 2020-2023; BMVC 2020-2023; CASE: 2019; 3DV 2020;
- Journal review T-RO, RA-L, JFR, TVCG, ISPRS P&RS, T-MM, T-ASE, IVCJ, TSMC:S
- Session chair IROS 2022
- Assoc. editor IROS 2023