PERSONAL INFORMATION

Dr. Zhongmou LI

Postdoctoral Research Associate

Robotics for Extreme Environments Group, The University of Manchester.

Engineering Building A, The University of Manchester, Manchester, M13 9PL.

zhongmou.li@manchester.ac.uk robin.zhongmou.li@gmail.com

zhongmouli.github.io

https://www.linkedin.com/in/zhongmou-li-b1a9321b6/

EDUCATION

Nov 2017 – Mar 2021 Ph.D. in Robotics

Institution: LS2N-CNRS, France
Supervisors: Isabelle Fantoni, Abdelhamid Cheiette, Vincent Bégoc
Thesis: Theoretical developments and experimental evaluation of a novel collaborative multi-drone grasping and manipulation system of large objects (link)

Sep 2015 – Aug 2017 M.Sc in Advanced Robotics

Institution: Centrale Nantes, France
Supervisors: Sébastien Briot, Abdelhamid Cheiette, Damien Six
Thesis: Motion planning and control of a Flying Parallel Robot (link)

Sep 2013 – Apr 2015 M.Sc in Navigation, Guidance and Control

Institution: Northwestern Polytechnical University, China

Sep 2009 – Aug 2013 B.Eng in Detection Guidance and Control Technology

Institution: Northwestern Polytechnical University, China

RESEARCH SKILLS

My research interests are designing and building new aerial robots, applying UAVs for various scenarios and applying control and other techniques for aerial robots.

UAV application
- Aerial manipulation with multiple drone cooperation
- Aerial inspection
- Aerial swarm

Real-time experiments
- Building drones using open-source (PixHawk) and commercial components (**video 1**, **2**)
- Designing and building innovative aerial robots (**video 3**)
- Applying control and other techniques on robots using ROS and C++ (**video 4**, **5**)
- Conducting experiments and physical tests for aerial robots (**video 6**, **7**)

Modeling and Control
- Kinematic and dynamic modeling of multi-body robots
- Control application

WORK EXPERIENCE

Nov 2021 – now Postdoctoral Research Associate

Institution: Robotics for Extreme Environments Group, The University of Manchester, UK
Project title: Aerial Monitoring Of Substations (AMOS)
Funding scheme: EPSRC Impact Acceleration Account (IAA) in collaboration with GE Renewable Energy
Overview: Integrated drones with inspection assets to detect faults in live HVDC substations emphasising higher TRL work and industrial engagement.

Nov 2017 – March 2021 Ph.D. Student

Institution LS2N-CNRS, France

Thesis title Theoretical developments and experimental evaluation of a novel collaborative multi-drone grasping and manipulation system of large objects

Funding scheme China Scholarship Council (CSC)

Overview
- designed a novel aerial manipulator Flying Gripper,
- developed the multi-body static and dynamic models for the Flying Gripper,
- analyzed the manipulability of the Flying Gripper robot using convex set techniques,
- built and tested a control algorithm in co-simulations and experiments ,
- tested the control algorithm for the Flying Gripper in experiments .

Nov 2018 – Jun 2020 Lab Research Assistant

Institution LS2N-CNRS, France

Overview Built setup for and maintained quadrotor experiments for students
- identified dynamic parameters of quadrotors,
- established communication among multiple quadrotors and a working station.

Feb 2017 – Aug 2017 Lab Research Assistant

Institution LS2N-CNRS, France

Master thesis title Motion planning and control of a Flying Parallel Robot

Overview
- modeled a flying parallel robot consisting of quadrotors joined by passive links,
- conducted motion planning considering dynamic constrains and payload limitations,
- tested the planed motion for the flying parallel robot in real world experiments.

PUBLICATIONS

Journal
- Zhongmou Li, Vincent Bégoc, Abdelhamid Chriette, and Isabelle Fantoni. “Wrench capability analysis and control allocation of a collaborative multi-drone grasping robot”. *In ASME Journal of Mechanisms and Robotics*, Accepted, **video 8**.

Conference
- Zhongmou Li, Xiaoxiao Song, Vincent Bégoc, Abdelhamid Chriette, and Isabelle Fantoni. “Dynamic Modeling and Controller Design of a novel aerial grasping robot”.*In:23rd CISM IFToMM Symposium on Robot Design, Dynamics and Control (RoManSy2020)*. Sapporo, Japan, Sept. 2020. **Best Student Paper Award, video 9**.

Reviewer
- IEEE Robotics and Automation Letters

TEACHING

Nov 2017 – Dec 2019 Teaching Assistant

Institution Centrale Nantes, France

Courses Control of linear multi-variable systems (Master)

Advanced modeling of robots (Master, Bachelor)

Nonlinear control theory (Master)

Duties Instructed practice lectures including theoretical explanation and simulation demonstration

SKILLS

Robot tools	ROS	C++	Python	Matlab	Adams
Robot development	Linux	Pixhawk	Raspberry Pi		Arduino
Languages	Chinese: mother tongue		English: C1		French: Fluent