Michael (Jiahe) Pan

◉ Zürich, Switzerland ✉ michael.pan31415@gmail.com ☎ +41 76 270 2285 ⦿ Personal Homepage

in LinkedIn ○ GitHub ⦿ Google Scholar

Education

ETH Zürich *Zürich, Switzerland*
MSc in Robotics, Systems and Control *Sep 2024 – Present*

- **Current GPA**: 5.7/6.0
- **Focus**: Reinforcement learning, Deep learning, Probabilistic AI, Computer vision, Motion planning, Computational motion modeling, Distributed control, Dynamic programming, Robot dynamics
- **Tutor**: Prof. Robert Riener (Sensory-Motor Systems Lab)

The University of Melbourne *Melbourne, Australia*
BSc in Mechatronics Engineering *Mar 2021 - Nov 2023*

- **Grade**: 87.7/100 (First Class Honors)
- **Dean's Honors List 2023** (top 3% of all BSc students)
- **Focus**: System modeling, analysis and control; Mechanics and electronics; Machine learning and AI

Research and Projects

Graduate Student Researcher *Zürich, Switzerland*
Robotics and Perception Group (RPG), The University of Zürich *Mar 2025 – Present*

- **Supervisor**: Prof. Davide Scaramuzza
- Working on data-driven differentiable simulation for learning agile and real-time adaptive quadrotor control in scenarios with complex and time-varying aerodynamics.

Research Assistant *Melbourne, Australia*
Computational HRI Lab (CHRI), The University of Melbourne *Jan 2024 - Jul 2024*

- **Supervisors**: Dr. Jonathan Eden, Prof. Wafa Johal, Prof. Denny Oetomo
- Conducted research in shared autonomy, human-robot interaction, and teleoperation, including modeling user performance with Fitts' Law, analyzing cognitive load and trust in shared control, and developing systems for robot teleoperation using haptic and motion capture interfaces.
- Implemented shared control policies, autonomous navigation, visual perception, natural language interaction, and mobile manipulation (TIAGo); developed custom controllers, trajectory generation pipelines, and human-robot interfaces using haptic devices and AR.

Research Assistant *Melbourne, Australia*
Monash Robotics Lab, Monash University *Nov 2022 - Jun 2023*

- **Supervisor**: Prof. Akansel Cosgun
- Developed a novel motion planning framework for integrated grasp selection and trajectory optimization for robotic arms operating in cluttered environments.
- Combined Bayesian optimization for grasp selection, sampling-based trajectory initialization (RRT-Connect), and receding-horizon SQP optimization with constraint-tightening; evaluated performance in simulation (Gazebo) and on the Fetch robot hardware.

Autonomous Perception and Powertrain Engineer *Melbourne, Australia*
MUR (Melbourne University Racing), The University of Melbourne *Apr 2022 – May 2023*

- Researched the design of the cone location algorithm in the race car's autonomous navigation pipeline.
- Performed optimal power calculations subject to vehicle constraints of the Formula Student competition.

Awards and Honors

Best Project Award for the Probabilistic AI course (ETH, Prof. Andreas Krause, 2025)

1st-place in the **Office Assistant Robot Competition** at HRI'24 (Boulder, Colorado, 2024)

The University of Melbourne Dean's Honors List (top 3% of all BSc students, 2023)

Summer Research Scholarship - Monash University (2022)

U21 Global Citizens - Common Purpose (2022)

Publications

Effects of Augmented-Reality Visualisations on Performance and Perception in MoCap-Based Robot Teleoperation
Q. Zhou, DA. Chacon, **J. Pan**, W. Johal.
[In review] IEEE International Symposium on Mixed and Augmented Reality (ISMAR), 2025.

Using Fitts' Law to Benchmark Assisted Human-Robot Performance
J. Pan, J. Eden, D. Oetomo, W. Johal.
IEEE/ACM International Conference on Human-Robot Interaction, 2025.

OfficeMate: Design and Evaluation of an Office Assistant Robot
J. Pan, S. Schombs, Y. Zhang, R. Tabatabaei, M. Bilal, W. Johal
IEEE/ACM International Conference on Human-Robot Interaction, 2025.

Assisting MoCap-Based Teleoperation of Robot Arm using Augmented-Reality Visualisations
Q. Zhou, DA. Chacon, **J. Pan**, W. Johal.
IEEE/ACM International Conference on Human-Robot Interaction, 2025.

Effects of Shared Control on Cognitive Load and Trust in Teleoperated Trajectory Tracking
J. Pan, J. Eden, D. Oetomo, W. Johal.
IEEE Robotics and Automation Letters (RA-L), 2024.

A Review of Differentiable Simulators
R. Newbury, J. Collins, K. He, **J. Pan**, I. Posner, D. Howard, A. Cosgun.
IEEE Access, 2024.

FaceVis: Exploring a Robot's Face for Affective Visualisation Design
S. Schombs, **J. Pan**, Y. Zhang, J. Goncalves, W. Johal.
ACM Extended Abstracts of the CHI Conference on Human Factors in Computing Systems, 2024.

Variable Grasp Pose and Commitment for Trajectory Optimization
J. Pan, K. He, J.M. Ong, A. Cosgun.
IEEE 5th International Congress on Human-Computer Interaction, Optimization and Robotic Applications, 2023.

Skills

Research Skills

- Hands-on experience with robotic platforms: Franka Panda, Fetch, TIAGo, Furhat, UR3, quadrotors.
- Theoretical and hands-on experience with reinforcement learning, imitation learning, motion planning & trajectory optimization, neural representations (NeRF), and policy learning in differentiable simulation.
- Independent and collaborative research project management, experimental design and implementation, data collection (simulation & real-world) and statistical analysis.
- Peer-reviewing for paper submissions (HRI'25).

Software Skills

- Python, C++, C, R, MATLAB; Linux (Ubuntu), PyTorch, JAX, Git, Docker, Conda.
- ROS, ROS2, IsaacGym, MuJoCo, Gazebo; MoveIt!, ROS Nav, TrajOpt, cvxpy, CasADi.

Hardware Skills

- g.tec EEG recording with 32-channel setup using dry electrodes on an EEG cap.
- Basic understanding of Unity, Hololens 2, Meta Quest 2, OptiTrack motion-capture systems.