

# Mingxi Jia

Linkedin: <https://www.linkedin.com/in/mingxi-jia-6997b9183>

Personal page: <https://github.com/SaulBatman>

Google scholar: Mingxi Jia

Email : [mingxi\\_jia@brown.edu](mailto:mingxi_jia@brown.edu)

Mobile : +1-857-250-1709

## EDUCATION

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- **Brown University** Providence, RI, US  
*Ph.D. in Computer Science; Advisor: Prof. Stefanie Tellex* Starting from Sep, 2023
- **Northeastern University** Boston, MA, US  
*Master of Science in Robotics, Computer Science track; GPA: 3.83; Advisor: Prof. Robert Platt* Sep 2021 - May 2023
- **Beijing University of Chemical Technology** Beijing, China  
*Bachelor of Engineering in Mechanical Engineering ; Distinguished Graduates Honor; GPA: 3.35* Sep 2016 - July 2020

## ACADEMIC EXPERIENCE

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- **Sample-efficient learning in robotic manipulation** Northeastern University, Boston, MA  
*Research Assistant. Supervised by Prof. Robert Platt* Oct 2021 - Current
  - **Few-shot Imitation Learning (Link)** :
    - Proposed a novel 3D data augmentation method that can create simulated expert data in 3D space
    - Introduced an **SO(2)**-equivariant imitation learning architecture based on steerable CNNs.
    - Built a PS4-controller-based demonstration collection framework with PID control on a physical UR5 robot.
  - **Equivariant On-robot Learning (Link)**:
    - Designed OpenCV-based reward and reset functions for real-world on-robot reinforcement learning.
  - **Simulator and Benchmarking for Robotic Manipulation (Link)**:
    - Designed and developed new simulation environments for benchmarking reinforcement learning algorithms in robotic manipulation.
- **Learning-based Object 3D Reconstruction** BNU-HKBU United International College, China  
*Research Assistant. Supervised by Prof. (Amy) Hui Zhang* Aug 2020 - Aug 2021
  - **Learning-based 3D Reconstruction**:
    - Served as team leader and implemented a pipeline for silhouette-based object 3D reconstruction, including salient object detection, object modeling (MAYA), and Multiphysics Simulation (COMSOL).
    - Developed a data analysis framework for 3D shape reconstruction using Principal Component Analysis (PCA).
- **Real-time High Resolution Plant Stress Monitoring** Boston, MA  
*Collaborator: Dr. Wenzhe Jiao (MIT)* Aug 2022 - Current
  - **Parallel Computing**:
    - Built a parallel data processing library based on Message Passing Interface (MPI) for analyzing global soil moisture on supercomputer clusters.
  - **Remote Sensing Image Processing**:
    - Implemented an image projection & cropping tool for National Land Cover Database (NLCD), based on Geopandas.

## PUBLICATIONS

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- Dian Wang, Xupeng Zhu, Jung Yeon Park, **Mingxi Jia**, Guanang Su, Robert Platt, Robin Walters. A General Theory of Correct, Incorrect, and Extrinsic Equivariance. **NeuIPS 2023**.
- **Mingxi Jia\***, Dian Wang\*, Guanang Su, David Klee, Xupeng Zhu, Robin Walters, Robert Platt. SEIL: Simulation-augmented Equivariant Imitation Learning. **ICRA 2023** & CoRL 2022 Workshop on Sim-to-Real Robot Learning: Locomotion and Beyond. (\*Equal contribution.) <https://arxiv.org/pdf/2211.00194>
- Dian Wang, **Mingxi Jia**, Xupeng Zhu, Robin Walters, Robert Platt. On-Robot Learning With Equivariant Models. **CoRL 2022**, Auckland, New Zealand. <https://arxiv.org/pdf/2203.04923.pdf>
- Dian Wang\*, Colin Kohler\*, Xupeng Zhu, **Mingxi Jia**, Robert Platt. BulletArm: An Open-Source Robotic Manipulation Benchmark and Learning Framework. **ISRR 2022**, Geneva, Switzerland. <https://arxiv.org/pdf/2205.14292.pdf>
- Dian Wang, Robin Walters, **Mingxi Jia**, Robert Platt. Equivariant Reinforcement Learning for Robotic Manipulation. **ICRA 2022 Workshop on Scaling Robot Learning**. [https://github.com/pointW/equi\\_rl](https://github.com/pointW/equi_rl)

## PROFESSIONAL SERVICES

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- **Conference Reviewer:** ICRA (2023,2024), RSS 2023 Workshop
- **Journal Reviewer:** Robotics and Automation Letters (RA-L)
- RSS2023 WS on Symmetries in Robot Learning (Link) Program Committee Member

## INVITED TALKS & EVENTS

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- **Northeastern At ICRA Seminar** Boston, MA  
*Organizer: Institute for Experiential Robotics, Northeastern University* May 25, 2023
  - **Presentation title:** Sample-efficient learning in robotic manipulation.
- **Boston Symmetry Day** Boston, MA  
*Organizer: Boston Symmetry Group* April 7, 2023
  - **Poster title:** SEIL: Simulation-augmented Equivariant Imitation Learning.

## TEACHING

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- **Reinforcement Learning and Sequential Decision Making, Northeastern University** Boston, MA  
*Teaching Assistant - Prof. Chris Amato* Sep 2022 - Dec 2022
  - **Lecturing:** Held TA office hours and mentored course projects.
  - **Material Design:** Designed midterm problems on MDP and dynamic programming.
- **Computer Organization(Fall, 2020), BNU-HKBU United International College** Zhuhai, Guangdong, China  
*Teaching Assistant - Prof. Haipeng Guo* Aug 2020 - Dec 2020
  - **Assignment Design:** Designed and reorganized lab instructions about micro-architecture, ISA, compiler, and circuit simulation.

## MENTORING

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- **Dev Vaibhav:** MS in Robotics student, Northeastern University. UR5 Arm VR Teleoperation (MS project).
- **Siddharth Maheshwari:** MS in Robotics student, Northeastern University. UR5 Arm VR Teleoperation (MS project).

## NOTABLE PROJECTS

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- **ORB-SLAM3 on iPhone (Link)**  
*EECE554 Course Project- Prof. Hanumant Singh* Feb 2022 - May 2022
  - **iPhone-PC Communication:** Built a real-time video streaming connection between PC and iPhone, using Wi-Fi routers.
  - **ORB-SLAM3 Optimization for Mobile Devices:** Conducted experiments based on the KITTI dataset and self-collected outdoor data, searching for the optimal parameters of FPS and illumination for mobile devices.
- **Hindsight Experience Replay for Robotic Manipulation (Link)**  
*CS5180 Course Project- Prof. Robert Platt* Sep 2021 - Dec 2021
  - **Hindsight Experience Replay:** Implemented the Hindsight Experience Replay paper using PyTorch in OpenAI gym's FetchPickAndPlace-v1 environment.
- **Mobile Rescue Robot (Link)**  
*EECE550 Course Project- Prof. David Rosen* Sep 2021 - Dec 2021
  - **Exploration & SLAM :** Built a self-exploration and cartographer-based SLAM turtle bot using ROS.
  - **Rescue Searching:** Designed a queue-based average filter for stabilizing Apriltag localization.

## WORK EXPERIENCE & LEADERSHIP

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- **BMW Beijing R&D Center** Beijing, China  
*Intern. Supervised by Dr. Frank Lehnert, Mrs. Dawei Li* Oct 2018 - Mar 2020
  - **Internal Coordination:** Headed the arrangement of internal surveys of innovative prototype improvements.
  - **Vehicle Benchmarking:** Assisted in the benchmarking of vehicle design, cost analysis, and user experience development of Human-Machine Interaction.
- **BUCT Debate Team** Beijing, China  
*President* Oct 2018 - Oct 2019
  - **Event Organizer:** Held university-wide debate competitions, creating opportunities to learn public speaking skills for minorities from undeveloped areas in China.
  - **Lecturer on Logic:** Gave lectures for freshmen on methods of deductive reasoning and public speaking.

## HONORS AND AWARDS

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- Khoury Research Apprenticeship, Northeastern University - 2022
- Distinguished Graduates of Beijing - 2020
- Beijing University of Chemical Technology (BUCT) Merit Student - 2019
- BUCT Student Leader Honor - 2018
- BUCT Youngster Robotics Competition Second Prize - 2018
- BUCT Renmin Scholarship— 2016, 2017, 2018, 2019