Dian Wang

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RESEARCH INTERESTS

Robot Learning, Geometric Deep Learning, Robotic Manipulation and Grasping, Reinforcement Learning

EDUCATION

Northeastern University — Boston, MA, USA
Ph.D. in Computer Science. Advisors: Prof. Robert Platt, Prof. Robin Walters — *Jan. 2020 − Present*
M.S. in Computer Science; GPA: 4.00/4.00 — *Sept. 2017 − Dec. 2019*

Sichuan University — Chengdu, China
B.Eng. in Computer Science and Engineering; GPA: 3.56/4.00 — *Sept. 2013 − June 2017*

EXPERIENCE

Northeastern University — Boston, MA, USA
Research Assistant — *Jan. 2018 − Present*
- Proposed symmetric neural network architectures for improving training efficiency in robotic manipulation tasks.
- Implemented an open-sourced robotic reinforcement learning environment library using PyBullet.
- Built an assistive robotic system to assist people with disabilities in household manipulation tasks.

Boston Dynamics AI Institute — Cambridge, MA, USA
Research Intern — *May 2023 − Aug. 2023*
- Proposed algorithms for solving long-horizon robotic manipulation tasks using geometric deep learning.

Institute of Computing Technology, Chinese Academy of Sciences — Beijing, China
Research Intern — *July 2016 − Aug. 2016*
- Led team of 4 interns to implement a user dynamic detection app based on data from gravity sensor.

PUBLICATIONS

22 **D. Wang**, S. Hart, D. Surovik, T. Kelestemur, H. Huang, H. Zhao, J. Wang, R. Walters, and R. Platt. Equivariant diffusion policy. Under review

21 X. Zhu, D. Klee, **D. Wang**, B. Hu, H. Huang, A. Tangri, R. Walters, and R. Platt. SE(3) keyframe action transporter. Under review

20 M. Jia, H. Huang, C. W. Zhewen Zhang, L. Zhao, **D. Wang**, J. X. Liu, R. Walters, R. Platt, and S. Tellex. Open-world language-conditioned pick and place. Under review

19 H. Huang, O. L. Howell*, **D. Wang***, X. Zhu*, R. Platt[†], and R. Walters[†]. Fourier transporter: Bi-equivariant robotic manipulation in 3d. In *International Conference on Learning Representations (ICLR)*, 2024. Link

18 H. Huang, **D. Wang**, A. Tangri, R. Walters, and R. Platt. Leveraging pick and place symmetries. *The International Journal of Robotics Research (IJRR)*, 2023. Link

17 **D. Wang**, X. Zhu, J. Y. Park, R. Platt, and R. Walters. A general theory of correct, incorrect, and extrinsic equivariance. In *Conference on Neural Information Processing Systems (NeurIPS)*, 2023. Link

16 H. H. Nguyen, D. Klee, A. Baisero, **D. Wang**, R. Platt, and C. Amato. Equivariant reinforcement learning under partial observability. In *Conference on Robot Learning (CoRL)*, 2023. Link

15 X. Zhu, **D. Wang**, G. Su, O. Biza, R. Walters, and R. Platt. On robot grasp learning using equivariant models. *Autonomous Robots*, 2023. Link

14 **D. Wang**, J. Y. Park, N. Sortur, L. L. Wong, R. Walters[†], and R. Platt[†]. The surprising effectiveness of equivariant models in domains with latent symmetry. In *International Conference on Learning Representations (ICLR)*, 2023. **Spotlight**. Link

13 M. Jia*, **D. Wang***, G. Su, D. Klee, X. Zhu, R. Walters, and R. Platt. Seil: Simulation-augmented equivariant imitation learning. In *International Conference on Robotics and Automation (ICRA)*, 2023. Link

12 H. Huang, **D. Wang**, X. Zhu, R. Walters, and R. Platt. Edge grasp network: A graph-based SE(3)-invariant approach to grasp detection. In *International Conference on Robotics and Automation (ICRA)*, 2023. Link

11 **D. Wang**, M. Jia, X. Zhu, R. Walters, and R. Platt. On-robot learning with equivariant models. In *Conference on Robot Learning (CoRL)*, 2022. Link

10 H. H. Nguyen, A. Baisero, **D. Wang**, C. Amato, and R. Platt. Leveraging fully observable policies for learning under partial observability. In *Conference on Robot Learning (CoRL)*, 2022. Link

9 **D. Wang***, C. Kohler*, X. Zhu, M. Jia, and R. Platt. Bulletarm: An open-source robotic manipulation benchmark and learning framework. In *The International Symposium on Robotics Research (ISRR)*, 2022. Link

8 H. Huang, **D. Wang**, R. Walters, and R. Platt. Equivariant transporter network. In *Robotics: Science and Systems (RSS)*, 2022. Link

7 X. Zhu, **D. Wang**, O. Biza, G. Su, R. Walters, and R. Platt. Sample efficient grasp learning using equivariant models. In *Robotics: Science and Systems (RSS)*, 2022. Link

6 **D. Wang**, R. Walters, and R. Platt. SO(2)-equivariant reinforcement learning. In *International Conference on Learning Representations (ICLR)*, 2022. **Spotlight**. Link

5 **D. Wang**, R. Walters, X. Zhu, and R. Platt. Equivariant Q learning in spatial action spaces. In *Conference on Robot Learning (CoRL)*, 2021. Link

4 A. Wilkinson, M. Gonzales, P. Hoey, D. Kontak, **D. Wang**, N. Torname, A. Sinclaire, Z. Han, J. Allspaw, R. Platt, and H. Yanco. Design guidelines for human-robot interaction with assistive robot manipulation systems. *Paladyn, Journal of Behavioral Robotics*, 2021. Link

3 O. Biza, **D. Wang**, R. Platt, J.-W. van de Meent, and L. L. Wong. Action priors for large action spaces in robotics. In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2021. Link

2 **D. Wang**, C. Kohler, and R. Platt. Policy learning in SE(3) action spaces. In *Conference on Robot Learning (CoRL)*, 2020. Link

1 **D. Wang**, C. Kohler, A. ten Pas, A. Wilkinson, M. Liu, H. Yanco, and R. Platt. Towards assistive robotic pick and place in open world environments. In *The International Symposium on Robotics Research (ISRR)*, 2019. Link

Honers and Awards

2023 JPMorgan Chase PhD Fellowship	JPMorgan Chase	*June 2023*
Best Paper Award Finalist	ICRA 2022 Workshop on Scaling Robot Learning	*May 2022*
Khoury College Graduate Research Fellowship	Northeastern University	*Aug. 2019*

Talks and Oral Presentations

Equivariant Models for Long-Horizon Manipulation	Boston, MA, USA
Boston Dynamics AI Institute	*Mar. 2024*
The Surprising Effectiveness of Equivariant Models in Domains with Latent Symmetry	Kigali, Rwanda
International Conference on Learning Representations (ICLR) 2023	*May 2023*
Equivariant Learning for Robotic Manipulation	Providence, RI, USA
Department of Computer Science, Brown University	*Apr. 2023*
Equivariant Learning for Robotic Manipulation	Boston, MA, USA
Boston Robotics Speaker Series, presented by Universal Robots	*Mar. 2023*
Equivariant Q Learning in Spatial Action Spaces	New York City, NY, USA
RSS 2022 Workshop on Scaling Robot Learning	*June 2022*
SO(2)-Equivariant Reinforcement Learning for Robotic Manipulation	Philadelphia, PA, USA
ICRA 2022 Workshop on Scaling Robot Learning	*May 2022*
Towards Assistive Robotic Pick and Place in Open World Environments	Hanoi, Vietnam
The International Symposium on Robotics Research (ISRR) 2019	*Dec. 2019*

Teaching

Guest Lecture on Equivariant Reinforcement Learning for Robotic Manipulation	
Reinforcement Learning and Sequential Decision Making (Northeastern CS5180), Prof. Lawson Wong	*Apr. 2024*
Guest Lecture on Equivariant Learning for Robotic Manipulation	
Geometric Deep Learning (Northeastern CS7180), Prof. Robin Walters	*Apr. 2023*
Guest Lecture on Leveraging SE(2) Symmetries in Robot Learning	
Robotics Science and Systems (Northeastern CS5335), Prof. Robert Platt	*Mar. 2022*

Mentoring

Haibo Zhao	M.S. at Northeastern		*Nov. 2023 - Present*
Mingxi Jia	M.S. at Northeastern	Now Ph.D. Student at Brown	*Dec. 2021 - May 2023*
Guanang Su	M.S. at Northeastern	Now Ph.D. Student at Univ. of Minnesota	*Dec. 2021 - May 2023*
Neel Sortur	Undergrad. at Northeastern		*May 2021 - Oct. 2022*
Zhengyi Ou	M.S. at Northeastern	Now Software Engineer at Medtronic	*Sept. 2020 - Dec. 2021*
Yida Niu	M.S. at Northeastern		*Sept. 2020 - Aug. 2021*

Professional Service

Lead Organizer, RSS 2023 Workshop on Symmetries in Robot Learning

Organizer, RSS 2024 Workshop on Geometric and Algebraic Structure in Robot Learning

Reviewer: IJRR2024. ICML 2024. ICLR 2023-2024. NeurIPS 2023. ICRA 2019, 2022-2024. CoRL 2022-2023. IROS 2021, 2023. RAL 2022-2024. T-RO 2022.

Media Coverage

Institute for Experiential Robotics Newsletter, Dian Wang - CoRL 2022 Presentation	*Jan. 2023*
Northeastern Global News, photo by Matthew Modoono, Link	*Sept. 2020*
IEEE Spectrum Video Friday, Link	*Sept. 2019*

Outreach

AI in Action - Everyday Robotics, presentation and demo at Northeastern University	*Apr. 2024*

Skills

Programming: Python, Java, C++

Tools: VSCode, PyCharm, IntelliJ IDEA, Git, LaTeX, Final Cut Pro

Robotics: Franka Emika, UR5, Baxter, Robotic Operating System (ROS), PyBullet, OpenRave

Machine Learning: PyTorch, NumPy