Yunfu Deng

Contact Information

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Education

University of Wisconsin, Madison, WI
Ph.D. in Computer Science, Advisor: Prof. Josiah Hanna *Sept. 2022 – Present*

Rutgers University, New Brunswick, NJ
M.S. in Electrical and Computer Engineering, Advisor: Prof. Abdeslam Boularias *May 2022*

Research Interest

My research focuses on reinforcement learning and representation learning for reliable and generalizable robot learning. I work on three connected directions: (i) learning transferable representations for sim-to-real and real-world robot manipulation; (ii) world models and latent dynamics for long-horizon prediction, planning, and policy improvement; and (iii) scalable evaluation and offline reinforcement learning for hierarchical and foundation-model-based controllers. I am particularly interested in dexterous and bimanual manipulation, and in connecting these directions to the training, evaluation, and reliable deployment of vision-language-action policies on real robots.

Selected Publications

Yunfu Deng, Sangwoo Shin, Brahma Pavse, Josiah Hanna. *RoboFQE: Rollout-Free Evaluation of Visual Robot Policies from Offline Trajectories.* **CoRL 2026**.

Yunfu Deng, Josiah Hanna. *Intra-Option Fitted Q-Evaluation: Evaluating Hierarchical Policies from Non-Hierarchical Data.* **NeurIPS 2026**.

Yunfu Deng, Josiah Hanna. *BIFROST: Bridging Invariant Feature Representation for Observation-space Sim2Real Transfer.* **IROS 2026**.

Yunfu Deng, Daniel Nikovski. *ORIGAMI: Object Representation Inferred Geometrically for Articulated Manipulation.* **IROS 2026**.

Yunfu Deng, Yuhao Li, Josiah Hanna. *Abstract Sim2Real through Approximate Information States.* **IEEE RA-L 2026** (also presented at NeurIPS 2025 Workshop on Embodied World Models for Decision Making and IROS 2026)

Mo Xu, **Yunfu Deng**, Josiah Hanna, Bilge Mutlu. *Grasp2Twist: Learning Bimanual Dexterous Jar Opening by Reinforcement Learning.* **Submitted to ICRA 2027**.

Shiyang Lu, Abdeslam Boularias, **Yunfu Deng**, Kostas Bekris. *Self-Supervised Learning of Object Segmentation from Unlabeled RGB-D Videos.* **ICRA 2023**.

Liam Schramm, **Yunfu Deng**, Edgar Granados, Abdeslam Boularias. *USHER: Unbiased Sampling for Hindsight Experience Replay.* **CoRL 2022**.

Yunfu Deng, Kun Xu, Yue Hu, Yunduan Cui, Gengzhao Xiang, Zhongming Pan. *Learning Effectively from Intervention for Visual-based Autonomous Driving.* **ITSC 2022**.

Employment and Experience

Mitsubishi Electric Research Laboratories
Research Intern, Host: Dr. Daniel Nikovski May 2025 – Dec. 2025

- Developed ORIGAMI, a training-free geometric pipeline that recovers articulated object kinematics from a single RGB-D demonstration to support sample-efficient RL (IROS 2026).
- Demonstrated zero-shot sim-to-real transfer for folding-ruler manipulation on an SO-101 arm, achieving 44.7% real-world success versus 9.3% for DrQ-v2 and 11.7% for AutoURDF.

ByteDance Seed Robotics
Research Intern June 2023 – Sept. 2023

- Developed a vision-language-action (VLA) model for robotic manipulation and fine-tuned it using ranking-based RL from human feedback.
- Improved success rate from 9.3% to 42.7% on the CALVIN benchmark.

DiDi Labs
Research Intern June 2024 – Sept. 2024

- Contributed to a closed-loop, multi-agent driving simulator initialized from real-world logs for evaluating foundation driving models.
- Implemented a ranking-based RLHF pipeline for foundation driving models, including preference data construction, reward-model training, and policy fine-tuning in closed-loop simulation.

University of Wisconsin, Madison
Ph.D. Student, Advisor: Prof. Josiah Hanna Sept. 2022 – Present

- Developed a cross-domain bisimulation framework that learns shared latent representations for zero-shot sim-to-real transfer under both perceptual and dynamics gaps (IROS 2026).
- Formalized abstract sim-to-real transfer and developed a self-predictive simulator-grounding method; achieved 73% navigation success and 56% ball-kicking success on a physical NAO bipedal robot (IEEE RA-L 2026).
- Designed Intra-Option FQE to evaluate hierarchical policies from non-hierarchical offline transition data (NeurIPS 2026).
- Developed RoboFQE for rollout-free evaluation of visual robot policies from offline trajectories (CoRL 2026).

Rutgers University, New Brunswick
Graduate Research Assistant, Advisor: Prof. Abdeslam Boularias Sept. 2021 – Aug. 2022

- Proposed USHER, an unbiased sampling algorithm for Hindsight Experience Replay that corrects hindsight bias in stochastic environments via importance sampling (CoRL 2022).
- Designed a self-supervised system for object segmentation from unlabeled RGB-D videos using 3D reconstruction and contrastive learning (ICRA 2023).

Chinese Academy of Sciences, Shenzhen Institute of Advanced Technology
Assistant Engineer Sept. 2019 – Aug. 2021

- Developed a hierarchical imitation learning framework for vision-based autonomous driving with expert interventions (ITSC 2022).

Professional Services

Reviewer: IROS (2021–2024), ICRA (2022–2024), CoRL (2023–2026), ITSC 2022, RLC 2026, IEEE RA-L 2026

Mentoring: Yuhao Li, undergraduate at UW–Madison (now Ph.D. at UMass Amherst), co-author on IEEE RA-L 2026 2024–2025