

Xiaoxiang (Tony) Dong

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EDUCATION

Carnegie Mellon University — BS Computer Science

📅 AUG 2023 - MAY 2027 🎓 GPA 3.96/4.0

Major in Computer Science, with concentration in Robotics.

EXPERIENCE

Momentum Lab — Undergraduate Researcher

📅 SEPT 2025 - PRESENT 📍 CMU Robotics Institute

- **Zero-Shot Functional Manipulation (1st Author):** Formulated *SemanCorr*, a semantic-anchored correspondence framework enabling zero-shot manipulation skill transfer across topologically varied object categories (*IEEE RA-L Under Review*).
- **Dexterous Policy Learning (2nd Author):** Co-developed a framework for learning dexterous manipulation policies directly from unconstrained RGB human videos via 3D hand-object trajectory reconstruction (*IEEE RA-L Under Review*).
- **Implementation:** Built visual feature matching and pose estimation pipelines using PyTorch, training policies across multi-DOF robotic hands and simulated environments.

DROP Lab — Research Intern

📅 MAR 2025 - AUG 2025 📍 CMU Robotics Institute & Vanderbilt College of Connected Computing

- **Video-to-Motion Generation (1st Author):** Developed a joint flow trajectory optimization framework to generate kinematically and dynamically feasible robot motions directly from RGB video demonstrations (*ICRA 2026*).
- **Cross-Modal Conditioning (2nd Author):** Co-designed a cross-modal instruction architecture leveraging Vision-Language Models (VLMs) to condition generative motion models for zero-shot robot execution (*ICRA 2026*).
- **Generative Modeling:** Implemented flow-matching based generative pipelines and evaluated object-centric motion synthesis across complex tabletop manipulation tasks.

Kantor's Lab — Undergraduate Researcher

📅 MAY 2024 - MAY 2025 📍 CMU Robotics Institute

- **Robotic System:** Designed and built an autonomous mobile robot to locate and collect scattered badminton shuttles in real-time.
- **Perception & Planning Pipeline:** Fine-tuned a custom Mask R-CNN model for shuttle detection, integrated a particle filter for state localization, and implemented a greedy Travelling Salesman Problem (TSP) algorithm for energy-efficient path planning.

PUBLICATIONS

X. Dong, W. Baron, H. Chen, U. Yoo, J. Ichnowski, and W. Zhi, "Semancorr: Semantic anchored correspondence for zero-shot manipulation skill transfer," in *Proceedings of the IEEE Robotics and Automation Letters (RA-L)*, Under Review, 2026. [[arxiv](#)].

H. Chen, **X. Dong**, T. Wu, L. Wang, Y. Jangir, Y. Niu, Y. Ye, H. Bharadhwaj, Z. Erickson, and J. Ichnowski, "Dexterous manipulation policies from rgb human videos via 3d hand-object trajectory reconstruction," in *Proceedings of the IEEE Robotics and Automation Letters (RA-L)*, Under Review, 2026. [[arxiv](#)].

X. Dong, M. Johnson-Roberson, and W. Zhi, "Joint flow trajectory optimization for feasible robot motion generation from video demonstrations," in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2026. [[arxiv](#)].

W. Barron, **X. Dong**, M. Johnson-Roberson, and W. Zhi, "Cross-modal instructions for robot motion generation," in *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2026. [[arxiv](#)].

LEADERSHIPS

Head Teaching Assistant — CMU 15-210

AUG 2026 - PRESENT (prev. Teaching Assistant: AUG 2025 - MAY 2026)

Course staff for *Parallel and Sequential Data Structures and Algorithms*; Designed lecture and homework materials, taught recitations, held office hours, graded assignments.

President & Team Captain — CMU Badminton Club

AUG 2025 - MAY 2026 (prev. Student Athlete: AUG 2023 - MAY 2025)

Organized collegiate team tournaments, hosted scrimmages with universities across Ohio-Pennsylvania regions.

ACADEMIC SERVICE

Paper Reviewer

- 📅 2026 IEEE International Conference on Robotics and Automation (ICRA)
- 📅 2026 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

Conference Volunteering

- Student Volunteer, 2026 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

PROJECTS

Reinforcement Learning for Block Pick-and-Place with Visual State Estimation

Investigated tradeoffs between PPO, SAC, and MBRL for block pick-and-place. Explored teacher-student distillation with changing input modality.

Mini-Beam Diffusion: Searching for Better Paths Through Noise

Explored an inference-time search strategy for diffusion models that maintains multiple candidate denoising trajectory, pruning less promising samples as generation progresses.

Optimizing Collection System: A Greedy Travelling Salesman Approach for Path-Following Agent

Built an autonomous robot that detects and collects scattered badminton shuttles using a custom Mask R-CNN model, a greedy TSP path planner, and a particle filter for localization.

AWARDS

🎓 CMU Summer Undergraduate Research Fellowship	📅 2026	📍 Carnegie Mellon University
📖 School of Computer Science Dean's List	📅 2023-2026	📍 CMU School of Computer Science
🏆 Governor General's Academic Medal	📅 2023	📍 Office of the Governor General of Canada
🏠 Canadian Mathematics Olympiads	📅 2023	📍 Canadian Mathematics Society
💻 USA Computing Olympiad - Gold Division	📅 2022	📍 United States Computing Olympiad Association

COURSEWORK

16-831: Introduction to Robot Learning	16-384: Robotic Kinematics and Dynamics
16-825: Learning for 3D Vision	10-301: Introduction to Machine Learning
10-423: Generative AI	16-280: Intelligent Robotic System
16-385: Computer Vision	16-299: Introduction to Feedback Control System