Itay Kadosh

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Education

University of Texas at Dallas Jan 2024 – May 2026

B.S. in Computer Science & B.S. in Applied Mathematics (Double Degree)

- Undergraduate GPA: 3.94/4.0; Graduate GPA: 4.0/4.0
- **Relevant Coursework:**
  - *Undergraduate:* Partial Differential Equations, Numerical Analysis, Advanced Vector Calculus, Probability Theory, Theory of Computation, Topology
  - *Graduate:* Statistical Methods in AI & Machine Learning, Design and Analysis of Computer Algorithms, Robotics, Machine Learning and Control Theory
- Completed consecutive 21-credit-hour semesters while maintaining a 3.95 GPA.
- **Activities**: Intelligent Robotics and Vision Lab, Chess Club, Comet Robotics Club, PUTNAM Club, Transfer Mentorship Program, Phi Theta Kappa Honor Society

Collin College Aug 2023 – Dec 2023

Associate of Applied Science (AAS) Computer Science Track

- GPA: 3.9/4.0
- **Relevant Coursework:** Linear Algebra, Computer Architecture, Ordinary Differential Equations
- Represented the College in math conferences as both a solo and team presenter under professor Mike Panahi.
- Featured on Collin College newsletter for representing the school at conferences.

Experience

Undergraduate Researcher Jul 2024 – Present

Intelligent Robotics and Vision Laboratory at The University of Texas at Dallas

- PI: Professor **Yu Xiang**
- Conduct research in robotic perception, semantic mapping, data-driven exploration for mobile robots operating in complex indoor environments, and novel control paradigms for locomotion.
- Co-authored and lead projects that have resulted in submissions to top robotics conferences.
- Host and lead lab demonstrations for industry visitors, undergraduate students, and K–12 groups, showcasing cutting-edge robotics research and communicating key ideas in perception, mapping, and learning-based control.

Undergraduate Researcher Jul 2024 – Present

HCORE REU - Department of Industrial Engineering at Clemson University

- PI: Professor **Tuğçe Işık**
- Participated in an NSF REU summer research experience that continued into the academic year, leading to a submission to a top industrial engineering conference.
- Co-authoring an experimental study on how task rotations with varying cognitive workload and complexity affect mental fatigue, worker errors, and task completion times.

Independent Study with Professor Mike Panahi, Collin College Sep 2023 – Mar 2024

- PI: Professor Mike Panahi
- Researched numerical analysis methods, implementing iterative solvers (Gauss-Seidel, SOR, Jacobi) and eigenvalue approximation using Gerschgorin's Theorems.
- Developed and optimized multi-language numerical models in C, Python, and MATLAB.
- Presented research findings at regional mathematics conferences.

Computer Science and Mathematics Teacher Feb 2022 – Jun 2025

- Taught mathematics and computer science to over 20 students, ranging from middle school to collegiate level.
- Specialization in subjects such as Linear Algebra, Calculus, Python Programming, Differential Equations, Data Structures and Algorithms, and Object-Oriented Programming.

Research

AutoX-SemMap: Autonomous Exploration and Semantic Updating of Large-Scale Indoor Environments with Mobile Robots *(under review)* July 2024 – Sept 2024 [Code] [arXiv:2409.15493]

Sai Haneesh Allu, **Itay Kadosh**, Tyler Summers, Yu Xiang
Intelligent Robotics and Vision Laboratory (IRVL)

- Co-developed AutoX-SemMap, an autonomous exploration and semantic mapping system for large-scale indoor environments with dynamic objects.
- Implemented the computer vision pipeline using and fine-tuning GroundingDINO and SAMv2 for open-set object detection and segmentation, then fused RGB-D data into point clouds to accurately localize objects on the global map.
- Designed and implemented the dynamic object updating module, associating objects in the current field of view with existing map entries and deciding whether each detection corresponds to a previously seen object or a newly appeared one.
- Co-authored paper currently under review at the *IEEE International Conference on Robotics and Automation (ICRA) 2026*.

RPX (Robot Perception X): Benchmark & Dataset for Robotics Perception Tasks *(ongoing)* Jan 2025 – Present

** indicates equal contribution*

Itay Kadosh[*], Jishnu Jaykumar[*], Sai Haneesh Allu, Yu Xiang
Intelligent Robotics and Vision Laboratory (IRVL)

- Co-led the design and development of RPX, a benchmark and dataset for evaluating vision foundation models in robotics settings.
- Built a dataset of 250 real-world objects captured against 120 unique backgrounds, targeting visual data modalities commonly encountered in robotic perception.
- Designed benchmark tasks to test specialist and generalist foundation models on unseen object instance segmentation (UOIS), visual/spatial grounding, next-best-view (NBV) prediction, novel view synthesis, monocular depth estimation, and camera pose estimation.
- Developing an evaluation package that allows other researchers to plug in their models, train on RPX, and obtain standardized benchmark results.
- Project in progress, with a planned submission to the *Robotics: Science and Systems (RSS) 2026* conference.

IntelX: Coverage Prediction for Efficient Indoor Robot Exploration Jan 2025 – Present

(ongoing)
Saurav Dosi, **Itay Kadosh**, Yu Xiang
Intelligent Robotics and Vision Laboratory (IRVL)

- Converted real-world architectural blueprints of university buildings into occupancy maps using a computer-vision pipeline to enable realistic simulation of indoor robotic exploration.
- Generated a dense exploration dataset of approximately 1M samples by simulating coverage-based exploration from multiple starting locations and recording local coverage statistics in a neighborhood around the robot.
- Trained a ResNet-based segmentation model as a learned local planner that predicts the highest coverage gain within a radius around the robot.
- Designed a global planning strategy that uses temporal memory of previous steps to select exploration actions that balance local coverage gain and long-term exploration efficiency.
- Project in progress, with a planned submission to the *Robotics: Science and Systems (RSS) 2026* conference.

Measuring the Effects of Mental Fatigue on Worker Performance Through Task Rotations *(under review)* May 2025 – Nov 2025

** indicates equal contribution*

Toni Dismuke[*], **Itay Kadosh**[*], Emily Yuan[*], Shirin Ghasemi, David Neyens, Tuğçe Işık

Department of Industrial Engineering, Clemson University

- Co-authored an experimental study on how task rotations with varying cognitive workload and complexity affect mental fatigue and worker performance.
- Designed and analyzed a within-subject experiment in which participants completed six tasks spanning manual, procedural, and diagnostic categories under realistic industrial noise conditions.
- Collected multimodal data including task completion times, error counts coded from video recordings, and subjective workload and fatigue ratings (NASA-TLX and custom post-task surveys).
- Investigate how task sequence and task characteristics shape fatigue trajectories and performance, with the goal of identifying distinct fatigue states and the mitigating effects of task rotation.
- Co-authored paper currently under review for presentation at the *Institute of Industrial and Systems Engineer (IISE) 2026* conference.

ARMoR: Arm-Based Robot Mobility on a Passive Platform via Reinforcement Learning of Contact-Driven Locomotion *(ongoing)* Aug 2025 – Present

Itay Kadosh[*], Daniel Kadosh[*], Robert Teal[*], Keval Shah[*]

CS 6341 - Robotics @ UTD

- Co-developed ARMoR, a novel mobile manipulator paradigm that replaces a motorized base with a passive omni-wheel platform driven solely by a high-DOF robotic arm.
- Designed and modeled a low-cost, 3D-printed passive holonomic base integrated with the open-source LeRobot SO101 arm, exported from CAD to URDF for physics-based simulation.
- Built a reinforcement learning environment in NVIDIA Isaac Sim with many parallel robots to learn contact-driven locomotion policies for forward translation and in-place rotation.
- Project in progress, with a planned submission to the *Conference on Robot Learning (CORL) 2026*.

Awards and Scholarships

Comet Transfer Scholarship - UTD

- $5,000 per year (renewable for up to 3 years).
- Awarded for academic excellence at Collin College (GPA 3.75–4.0).

Phi Theta Kappa Scholarship - UTD

- $1,000 per year (renewable for up to 3 years).
- Awarded for Phi Theta Kappa Honor Society membership (GPA 3.5–4.0).

Undergraduate Research Scholar Award 2025 - UTD

- $500 awarded to continue doing research for the work on AutoX-SemMap.
- Presented AutoX-SemMap in a research symposium at UTD.

References

Yu Xiang
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Ovidiu Daescu
Head of the CS Department/Research Advisor, University of Texas at Dallas
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Tuğçe Işık
Operations Reasearch and Controls Professor/Research Advisor, Clemson University
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Mike Panahi
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