

Eley Ng

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CONTACT

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CORE COMPETENCIES

Machine learning, generative models, deep learning, Transformers, VAE, GAN, diffusion models, robotics, PyTorch, Python programming, robotics

EDUCATION

Stanford University

Stanford, CA

PhD in Mechanical Engineering (Robotics, AI)

Sept. 2019 – June 2023

Advisor: Monroe Kennedy III

Thesis Committee: Dorsa Sadigh, Mac Schwager

Stanford University

Stanford, CA

MS in Mechanical Engineering

Sept. 2017 – June 2019

University of Texas at Austin

Austin, TX

BS in Mechanical Engineering, Top 5% of Class

Aug. 2013 – May 2017

RELEVANT EXPERIENCE

Diffusion Co-Policy for Human-Robot Collaboration

Trained an imitation learning robot assistant to predict future multimodal human and robot action trajectories for model predictive control using a Transformer-based diffusion network. Achieved state-of-art performance, shared task understanding, and human-like behavior on the cooperative table-carrying task.

Sampling Waypoint Predictions for a Cooperative Planner

Trained a sampling-based planner to generate waypoints for a cooperative robot partner on the table-carrying task. Evaluated the planner with a human-in-the-loop and demonstrated on a real robot.

Learning Sampling Distributions for States and Joint Actions

Developed a model-based reinforcement learning framework for a robot assisting in the human-robot cooperative carrying task. Learned state and action distributions from demonstrations for long-horizon prediction and planning.

SKILLS

Programming Python, MATLAB, C++, Linux, Javascript.

Data Science NumPy, Matplotlib, SciPy.

Learning PyTorch, PyTorch Lightning, AWS, Gym, MuJoCo, ROS.

Robots/Hardware Interbotix Locobot, Turtlebot, Motiv Motion Capture

AWARDS & GRANTS

Joel H. Ferziger Memorial Fellowship

2020-2023

Human-Centered AI (HAI) Seed Grant

2020

	NSF Graduate Research Fellowship	2017
	UT Austin Engineering College Honors	2017
	UT Austin Leadership Collaborative Award	2017
	Undergraduate Research Fellowship	2014
	SanDisk Engineering Scholarship	2013
	2nd Place National Winner, Toshiba Science Competition	2012
WORK EXPERIENCE	NASA Ames, Mountain View, CA	June - August 2017
	Research internship with the Diagnostics and Prognostics Group in the Intelligent Systems Division under Christopher Teubert.	
	Intel Corporation, Hillsboro, OR	June - August 2016
	Internship in mechanical design with the New Technology Group.	
	Oregon State University, Corvallis, OR	June - August 2015
	Research Internship in soft robotic actuators under Yiğit Mengüç.	
	Sandia National Laboratories, Albuquerque, NM	2014 - 2015
	Internship in computation and finite element analysis.	
PUBLICATIONS	[5] Eley Ng , Ziang Liu, and Monroe Kennedy III. Diffusion Co-Policy for Synergistic Human-Robot Collaborative Tasks. <i>arXiv preprint, arXiv:2305.12171</i> .	
	[4] Eley Ng , Ziang Liu, and Monroe Kennedy III. It Takes Two: Learning to Plan for Human-Robot Cooperative Carrying. <i>IEEE International Conference on Robotics and Automation (ICRA), 2023</i> .	
	[3] Eley Ng , Ziang Liu, and Monroe Kennedy III. Learning Action and State Sampling Distributions for Human-Robot Collaboration. <i>Workshop on Learning from Diverse, Offline Data, Robotics: Science and Systems (RSS), 2022</i> .	
	[2] George E. Gorospe Jr., Matthew J. Daigle, Shankar Sankararaman, Chetan S. Kulkarni, and Eley Ng . GPU accelerated prognostics. <i>Annual Conference of the PHM Society, 2017</i> .	
	[1] Shixuan Yang, Eley Ng , and Nanshu Lu. Indium Tin Oxide (ITO) serpentine ribbons on soft substrates stretched beyond 100%. <i>Extreme Mechanics Letters, 2015</i> .	
TEACHING	CS 339R (ME 326): Collaborative Robotics	Winter 2022
	Teaching Assistant, Stanford University.	

This course focuses on how robots can be effective teammates with other robots and human partners, teaching concepts such as robot perception and control, teammate behavioral modeling, inter-agent communication, and team consensus. Course involves teaching through literature review, research proposals, and group project working with real robots (Interbotix LoCoBot) in ROS/Python/C++.

Average student rating: 4.25/5.00.

ENGR 15: Dynamics

Fall 2021

Teaching Assistant, Stanford University.

This course teaches the application of Newton's Laws to solve 2-D and 3-D static and dynamic problems, particle and rigid body dynamics, freebody diagrams, and equations of motion, as well as dynamic simulations.

Average student rating: 4.33/5.00.

MENTORING

Ziang Liu (MS CS, Stanford University), Bryn M. Hughes (BS CS, Stanford University), J.D. Kelly (BS EE, Stanford University), Ahad Rauf (ME PhD, Stanford University)

OUTREACH

Stanford Mechanical Engineering Women's Group

2020 – Present

Co-organize Women's Seminar Series (ENGR 311A) and social events with regular attendance of 30, initiated Dine with Professor events to open discourse between the graduate student community and women in STEM faculty.

Research Mentor, SURI Program

2019 - 2020

Mentored Stanford CS and EE undergraduate research students on two projects: 1) developing an American Sign Language detection and generator mobile app, and 2) online simulator for robotic task.

First Year ME PhD Mentorship Program

2019 - 2020

Mentored first year ME PhD student.

WME President, VP, Outreach Chair

2014 - 2017

Sought and secured \$8,500 (1000% increase in funding, starting from a budget deficit) from corporate sponsors in 2016 as club president. Developed team projects (3D-printed prostheses), coordinated a series of speakers from industry and academia for weekly meetings, coordinated outreach events, and organized recruitment events in various leadership roles.

MEUAB Nominated Member

2016 - 2017

Selected by the department to serve on the UT Austin Mechanical Engineering Undergraduate Advisory Board to discuss and implement department and curriculum changes with faculty of Mechanical Engineering.