Amal Nanavati

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EDUCATION

UNIVERSITY OF WASHINGTON
PhD in Computer Science, Exp. Mar 2025
Faithful Steward Endowed Fellow (2019-20)
CARNEGIE MELLON UNIVERSITY
BS in Computer Science, May 2018
Additional Major in Global Studies
Dean's List (F14, S15, F15, S16, F16, S17)
QPA: 3.96 / 4.0

SELECTED COURSEWORK

TECHNICAL
CSE 599W Reinforcement Learning (Sp20)
CSE 599I Interactive Learning (Wi20)
CSE 599M Robustness in ML (Au19)
10-812 Never-Ending Learning (S18)
16-831 Statistics in Robotics (F17)

SOCIAL PERSPECTIVES
HCDE 548B Critical Tech Practice (Sp21)
CSE 599P Computer Ethics (Wi21)
79-318 Sustainable Social Change (F17)
51-473 Design, Policy for Hum. Impact (F16)

EXTRACURRICULARS

UAW 4121: Elected (head) steward, advocating for student employee needs (2019-)
Anti-Racism Advocate: co-created a workshop series for robotics/AI practitioners at UW to reflect on our role in racism (2020)
Teknowledge: cofounded, teaching CS at underresourced middle schools (2016-2018)
CMU Student Senate: elected, raising awareness about mental health and sexual violence on campus (2016-2017)
CMU FORGE: volunteering with local resettled refugee families (2016-2018)

HONORS

NSF GRFP Fellow (2021-)
Fulbright Fellowship (Japan) (2018-19)
Phi Beta Kappa (Fall 2017)
K & L Gates Prize (Spring 2018)
Senior Leadership Recognition (Spring 2018)
Osher Institute Award, 1st place, CMU
Meeting of the Minds (2017, 2018)

SKILLS

Python • ROS • C++ • PyTorch • Tensorflow
• R • Go • C • JavaScript • ReactJS • AWS

INDUSTRY EXPERIENCE

USER EXPERIENCE RESEARCH INTERN | Zipline, Wi 2023
- Investigated user perceptions of droid motion during delivery. Worked with planning and controls teams to integrate research insights into algorithms.
- Extended a simulation environment to generate realistic delivery videos.

SOFTWARE ENGINEERING INTERN | Thumbtack, Su 2016
- Designed & implemented a Go service to send push notifications to Thumbtack's mobile apps. Implemented data analytics for that service.
- Concurrently migrated millions of items between SQL, DynamoDB, and S3.

RESEARCH EXPERIENCE

ROBOT-ASSISTED FEEDING | 2021-
- System design & impl. for a robot arm to feed people w/ motor impairments.
- Developed an extensible library for planning and executing robot arm motions, integrating **behavior trees**, **ROS2**, and **MoveIt2**.
- Lead a team to develop a **React** app for users to interact with the robot.
- Learned models of user preferences for robot motion, using crowdsourced data from a custom simulation tool developed in **ReactJS, Three.js, & Flask**.
- Implemented an end-to-end pipeline that learns how a robot should skewer food, using multi-modal data (video, haptic) of humans skewering food.
- Publications: "Design Principles for Robot-Assisted Feeding..." (HRI 23), "Towards General Food Acquisition..." (CoRL 2023)

ROBOTS ASKING HUMANS FOR HELP | 2019-21
- Developed a model of human help-giving behavior, using Julia and POMDPs, which enabled a robot to **perform 1.5x better** than state-of-the-art approaches by effectively asking for help.
- Designed & implemented help-seeking behavior on a mobile robot, which enabled error-free navigation for 32 hours.
- Publications: "Modeling Human Helpfulness..." (RSS 21), "Not All Who Wander Are Lost..." (HRI 22)

ROBOT SHOPKEEPER: MULTIPARTY INTERACTIONS | 2018-19
- Designed & implemented an **attention-based deep neural network in Tensorflow** that takes in multimodal data on customer actions and outputs how a robot shopkeeper should respond.
- The network predicted more socially appropriate responses than state-of-the-art approaches, **outperforming them by up to 30%**.
- Publication: "Autonomously Learning One-to-Many..." (HRI 20)

ASSISTIVE ROBOTS FOR BLIND TRAVELERS | 2016-19
- Developed, user tested, and implemented interaction modalities and autonomous navigation skills in **ROS** for a mobile robot to guide blind users.
- Designed a planner that simulates how users follow robots, **bringing users 1.8x closer to their goal** than a planner that only accounted for the robot.
- Publication: "Follow the Robot..." (IROS 19), "Coupled Indoor Nav..." (HRI 18)

TEACHING EXPERIENCE

INSTRUCTOR | CSE 416, Introduction to ML, Su 2022
- Taught 80+ students machine learning: deep learning, regression, matrix factorization, etc. Managed a team of 5 TAs. Instructor Eval: **4.7/5.0**