Prithu Pareek

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EDUCATION

Carnegie Mellon University Pittsburgh, PA   May 2023
Bachelor of Science in Electrical and Computer Engineering: GPA: 3.87/4.00

WORK EXPERIENCE

Aurora Innovation - Mountain View, CA
Robotics Motion Planning Intern   May 2022 – August 2022
- Conceptualized and introduced new logic which enables the autonomous vehicle to perform lane changes into upcoming splitting lanes in situations where the optimal route is blocked by construction
- Modified several portions of the strategy planning architecture to enable better performance for lane selection tasks in complex construction scenarios

RESEARCH EXPERIENCE

United States Naval Research Laboratory - Washington, DC
Collaborator – Navy Center for Applied Research in Artificial Intelligence   May 2021 – present
- Discovered a breakthrough solution for bimanual manipulation in dual-armed robots with use cases in strategic operations on land, underwater, and in space
- Created a simulator for the DRC HUBO robot using ROS in Gazebo and RViz with MoveIt integration for controls
- Implemented a novel, PRM-based, MoveIt and OMPL integrated, dynamic motion planner enabling the HUBO robot to asynchronously plan and execute motions on its two robot arms and around moving obstacles

Carnegie Mellon University Robotics Institute – Pittsburgh, PA
Undergraduate Research Assistant – Transportation, Bots, and Disabilities Lab   May 2020 – present
- Simulated humans and human motion in Gazebo to test a robot guide for the visually impaired in public spaces
- Designed and implemented a full AI based conversational pipeline in ROS - from speech recognition to synthesis - to enable the robot to communicate verbally with people and keep track of the context of the conversation
- Conducted a study comparing the quality/safety of different planner trajectories for a guide robot approaching a user with a visual impairment

Harvard Medical School/Boston Children's Hospital - Boston, MA
Research Intern – Kunkel Laboratory   June - August 2017 & July - August 2018
- Initiated a study of a novel animal model of TPM3 Congenital Myopathies at the lab of Dr. Lou Kunkel
- Conducted genotyping of mutated fish and birefringence analysis to find the phenotypic response to the genetic mutation and determine if the animal model is a good representation of the human condition.
- Studied treatments of Duchenne Muscular Dystrophy using animal models
- Carried out trials of serotonin modulators on zebrafish animal models resulting in the conclusion that they were not effective methods of treatment

PUBLICATIONS

Tan, X. Z., Carter E. J., Pareek P., & Steinfeld, A. (in press). Group Formation in Multi-Robot Human Interaction During Service Scenarios. *The 24th International ACM SIGCHI Conference on Multimodal Interaction.*

Limprayoon, J. "Fern," Pareek, P., Tan, X. Z., & Steinfeld, A. (2021). Robot Trajectories When Approaching a User with a Visual Impairment. *The 23rd International ACM SIGACCESS Conference on Computers and Accessibility*, 1–4. https://doi.org/10.1145/3441852.3476538

Spinazzola, J. M., Lambert, M. R., Gibbs, D. E., Conner, J. R., Krikorian, G. L., Pareek, P., Rago, C., & Kunkel, L. M. (2020). Effect of serotonin modulation on dystrophin-deficient zebrafish. *Biology Open*, bio.053363. https://doi.org/10.1242/bio.053363

PROJECTS

Path Planning in Robot Guides for Visually Impaired, Robotics Planning Final Project   April - May 2021
- Engineered and simulated a turn-radius constrained lattice graph-based ARA* planner using ROS and SBPL to prevent the guide robot from rotating in place when near a person with a visual impairment for increased safety

Effect of Robot Embodiment on Human Cognitive Gains, HRI Final Project   April - May 2021
- Devised and conducted a study where participants received assistance from various embodiments of a Misty robot while solving nonogram puzzles to determine if the physical embodiment of a robot has an effect on learning rates

Farm to Table – Online Produce Marketplace, Ayadee Hackathon – 1st Place   June - September 2020
- Designed a web-based platform to connect the excess capacity of produce on farms with the unmet need for produce in food banks, with distributors in the middle facilitating the transaction efficiently

BioPay – Biometric Payment Platform, 15112 Term Project   November - December 2019
- Developed a biometrically authenticated payment and transaction platform, packaged as an executable Mac app, integrating OpenCV, tkinter, and the Python Face Recognition library
- Created user accounts and inventory management/analytics using MySQL, Google Cloud and phpMyAdmin
- Implemented SHA1 in Python, used for account security and encryption when interfacing with the database

Spotify Mood-based Playlist Generator, Hack112 Hackathon – 3rd Place   November 2019
- Developed an algorithm to curate a customized playlist of songs based on a user's mood and various song characteristics such as danceability, valence, and energy using the Spotify API, and Spotipy python library
- Integrated TensorFlow and OpenCV to detect a user's mood using the webcam

SKILLS

Programming languages/libraries: Python, C, C++, C#, Java, NodeJS, SQL, ReactJS, HTML/CSS/JS
Software: MS Office, Git, Fusion 360, Altium Designer, ROS, Gazebo, Logic Pro, Adobe Photoshop, Final Cut Pro

LEADERSHIP & ACTIVITIES

Carnegie Mellon Undergraduate Student Senate, Undergraduate Student Senate Chair, Senator   2020 - present
- Advocated for the students to the admin, drafted and implemented policies benefiting of the student body while serving as the Chair of the Undergraduate Student Senate (2022 - present)
- Former Chair of the Business Affairs Committee tasked with overseeing transportation, housing, dining, and campus facilities (2021-2022)
- Member of the Undergraduate Student Affairs Council convened by Dean of Students Gina Casalegno (2021 - 2022)
- Member of the Parking and Transportation Advisory Committee (2021 - 2022) where I successfully advocated for students to provide parking accommodations and financial assistance to those with disabilities and demonstrated financial need
- Member of the Hourly Student Worker Working Group tasked with improving the experience of students employed by Carnegie Mellon (2021 - present)
- Drafted, passed, and implementing proposals overhauling CMU's shuttle services and piloting all-gender housing
- Led an initiative to provide members of the campus community with digital access to the Pittsburgh Post-Gazette
- Collected feedback from community stakeholders on various projects aimed at improving campus dining including increasing sustainability, improving the meal plan system, and increasing off-campus dining partner locations

Carnegie Mellon Racing   2019 – 2021
- Designed a module using Altium allowing for long-range communications between the driver and pit crew
- Collaborated to build a web dashboard with ReactJS to show the live status of the car and allow for remote control