LARISA YEN CHIN LOKE

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EDUCATION

PhD in Mechanical Engineering, Northwestern University, Evanston, IL — Sep 2020 - Present

- **Research Areas:** Assistive and Rehabilitative Robotics, Human-Robot Interaction, Machine Learning
- **GPA:** 3.98/4.00
- **Awards:** Walter P. Murphy Fellowship (2020-2021)
- **Courses:** Robotic Manipulation, Engineering Optimization, Embedded Systems, Machine Learning and Artificial Intelligence for Robotics, Mechatronics, Active Learning for Robotics

BEng in Mechanical Engineering, Nanyang Technological University (NTU), Singapore — Aug 2016 - Jul 2020

- **Specialization:** Robotics and Mechatronics
- **GPA:** 4.86/5.00 (Honours with Highest Distinction)
- **Awards:** Nanyang Scholarship (2016-2020), CN Yang Scholars Programme (2016-2020), School of Mechanical and Aerospace Engineering Dean's List (2017, 2018)

RESEARCH EXPERIENCE

PhD Student, argallab, Northwestern University — Sep 2020 - Present
Supervisor: Dr Brenna D. Argall

- Designed and carried out human-subject studies to assess bias in operating assistive device teleoperation interfaces, and tested an algorithm for creating a custom assistive device control mapping based on individual end-users' bias profiles.
- Paper "Control Interface Remapping for Bias-Aware Assistive Teleoperation" has been accepted for oral presentation and publication at the IEEE International Conference on Rehabilitation Robotics 2022.

Visiting Student Researcher, Robotics Institute, Carnegie Mellon University — Jun 2019 - Dec 2019
Supervisors: Dr John M. Dolan, Dr Christoph Mertz

- Trained and evaluated deep convolutional neural networks for offline detection and classification of rare traffic signs, working with Faster R-CNN and PyTorch
- Produced synthetic training images by inserting prototype traffic signs onto real background scenes
- Used image augmentation techniques such as affine and perspective transformations, flipping, cropping, and blurring transformations to artificially inflate the training datasets

Undergraduate Researcher, Rehabilitation Research Institute of Singapore, NTU — Jan 2018 - Apr 2018
Supervisor: Associate Professor Ang Wei Tech

- Worked to develop a system for measuring lateral forces exerted by a patient during the wipe table task, an activity in task-oriented training for upper limb rehabilitation
- Explored and tested various sensors such as strain gauges, load cells, and variable resistance fabric-based stretch sensors for force measurement
- Developed a preliminary design in SolidWorks for a force-measuring platform equipped with load cells

Undergraduate Researcher, Robotics Research Center, NTU — Aug 2017 - Nov 2017
Supervisor: Associate Professor Ang Wei Tech

- Re-engineered the Pro-Balance, an unstable balance board which serves as a balance assessment and training tool
- Installed and tested a wireless tilt angle data collection system to provide real-time feedback from the balance board to evaluate balance ability

WORK EXPERIENCE

Maker Developer, tinkermind Singapore, CG Education & Technology Solutions — Jun 2020 - Aug 2020
Supervisor: Mr Ismail Khamis

- Developed education kits and material for maker education programmes, including a mini Drone kit for teaching flight physics and control

Research Intern, Schaeffler Hub for Advanced Research, Schaeffler Singapore — May 2018 - Jan 2019
Supervisors: Dr Marcel Ph. Mayer, Mr Jannick Altherr

- Developed a wireless braking system combining hydraulic friction brakes and electric regenerative braking for a personal mobility device
- Built and tested a bench prototype which makes use of RF radio for wireless communication, and Arduino for computation and control of the amount of friction braking to supplement regenerative braking force

PUBLICATIONS

Andrew Thompson, Larisa YC Loke, and Brenna Argall. "Control Interface Remapping for Bias-Aware Assistive Teleoperation." arXiv preprint arXiv:2205.08489 (2022). *To appear in Proceedings of the IEEE International Conference on Rehabilitation Robotics 2022.*

TEACHING EXPERIENCE

Grader, CS/ME 301 Introduction To Robotics Laboratory, Northwestern University Jan 2022 - Mar 2022
Supervisor: Dr Brenna D. Argall

- Worked as a teaching assistant, which included being available during laboratory periods twice weekly to assist students with code and hardware, and running student demo sessions 3 times during the course of the class.
- Graded student demos and homework assignments and provided written feedback on reports

Grader, ME 449 Robotic Manipulation, Northwestern University Sep 2021 - Dec 2021
Supervisor: Dr Kevin Lynch

- Graded homework assignments and the final course project
- Conducted office hours every three weeks (in rotation with the other graders) to provide support for students' homework assignments and final projects
- Gave a lecture on Time-Optimal Time Scaling

PROJECTS

Sequential Quadratic Programming from scratch in Python Mar 2022 - Apr 2022

- Worked in a team of 2 to develop a Sequential Quadratic Programming (SQP) implementation in Python from scratch (only using Numpy)
- Validated our SQP implementation by testing on benchmark optimization functions and compared results against SQP implementations in standard optimization packages such as Scipy and Isight.

Automated 3D point cloud reconstruction using a robot arm and a RGB-D camera Oct 2020 - Dec 2020

- Worked in a team of 5 to develop an automated system for reconstructing 3D object models with point clouds
- Used ROS to interface between a Rethink Sawyer Robot arm, an Intel RGB-D Realsense Camera, and a turtlebot3 burger
- Used the MoveIt Motion Planning Library in ROS to coordinate the motion of the Sawyer Robot and the turtlebot3 to capture object pointclouds from multiple views for use in the reconstruction pipeline

Design and Development of Self-cleaning Window Jan 2018 - May 2018

- Worked in a team of 8 to design an automated window-cleaning system
- Designed the mechanical system in SolidWorks and built a scaled-down proof-of-concept prototype
- Led the development of a business plan for the sale of the proposed self-cleaning window

Design and Development of Spherical Rolling Robot with Jumping Capabilities May 2017 - Aug 2017

- Worked in a team of 5 to develop a remote-controlled jumping spherical robot for reconnaissance and exploration purposes
- Designed the jumping and driving mechanisms of the robot, modelled the internal structure of the robot in SolidWorks for 3D printing, and built multiple iterations of a working robot which achieved a jump height of 75% its own height

SKILLS

Programming Languages	Python, C/C++, Arduino
Operating Systems	Ubuntu Linux, Robot Operating System (ROS), Windows
Software	Solidworks, Matlab, Eagle
Tools	Git/GitHub, LaTeX, Docker, Microsoft Office
Languages	English (Native) & Mandarin Chinese (Proficient)

EXTRA-CURRICULAR ACTIVITIES

NTU Harmonix, Cultural Activities Club, NTU Aug 2017 - July 2020
Member

- Active member of NTU's A Cappella Club, involved in school and public performances approximately 4 times a semester
- Participated in the 2018 Singapore A Cappella Championships, placed 6th

CN Yang Scholars' Club, NTU
Press and Publicity Director Aug 2017 - July 2018

- Led a team of 3 committee members to design and produce press and publicity materials for club events. Responsibilities included promotional posters and videos, event tickets, photobooth backdrops, event