PRATYUSHA GHOSH

(she/her/hers)
2nd year CS PhD Student
Healthcare Robotics Lab | Contextual Robotics Institute
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RESEARCH INTERESTS

My research is in the field of Human-Robot Interaction, and it focuses on the design and development of new telepresence technologies that facilitate remote activities, learning, communication, and collaboration in healthcare and educational settings. Some of my interests include designing more intuitive and usable teleoperation interfaces and the design of appropriate (autonomous) robot behaviors for safety-critical environments. I am passionate about improving accessibility and inclusion with my research and am currently working on several projects in this area.

EDUCATION

University of California San Diego September 2021 - Present
Computer Science PhD student (GPA: 4.0)
Advisor: Dr. Laurel Riek, Healthcare Robotics Lab

Principal Member of Robotics Graduate Organization (RoboGrads) @ UC San Diego – Social Activities Chair

National University of Singapore August 2017 – June 2021
Bachelor of Science in Life Sciences (Honors) with Specialization in Biomedical Science
Second Major in Statistics
Minors: Public Health, Psychology

Honors Thesis: Machine Learning to Predict Methotrexate Response in Rheumatoid Arthritis Patients Using Clinico-Genetic Features

Raffles Institution (Junior College) January 2015-December 2016
Recipient of Raffles Diploma with Distinction in Community and Citizenship 2016
Recipient of Raffles Diploma with Merit in Character and Leadership 2016
Recipient of Ministry of Education Edusave Award for Achievement, Good Leadership and Service 2016

Raffles Girls' School (Secondary) January 2011- December 2014
Recipient of Raffles Colors Outstanding Service Award (House Leadership Board) 2014
Recipient of Lim Hsiu Mei Community Service Award 2014
Recipient of Ministry of Education Edusave Award for Achievement, Good Leadership and Service 2014

PUBLICATIONS

Matsumoto, S., **Ghosh, P.**, Jamshad, R., Riek, L. D. (submitted) Robot, Uninterrupted: Telemedical Robots to Mitigate Care Disruption

Ang, L., **Ghosh, P**., & Seow, W. J. (2021). Association between previous lung diseases and lung cancer risk: a systematic review and meta-analysis. *Carcinogenesis*, *42*(12), 1461-1474.

PROJECTS AND RESEARCH EXPERIENCES

CSE276D Healthcare Robotics – "Hey Stretch" (March 2022 – June 2022)
Developed a voice-controlled system to control the Stretch robot by engaging in co-design sessions with our stakeholders. Interviews with the stakeholders prompted ideas that could support caregivers, the elderly population, and people with disabilities. Voice control would allow for increased independence for the elderly and people with disabilities, and therefore alleviating caregiver burden. Utilized ROS and Python to implement 1) voice commands, 2) joint and base control, 3) voice to joint and base control, and 4) a feature for autonomous navigation.

CSE276B Human-Robot Interaction - "Bot-the-Builder" (January 2022 – March 2022)
Developed a teleoperated TurtleBot system using ROS and Unity3D that facilitated efficient remote collaboration. Some features include a navigation interface, web socket connection to connect the navigation interface to the robot, GUI for the robot, and a feature on the interface to enable autonomous navigation of the robot.

CSE210 Software Engineering Project (September 2021 – December 2021)
Created the 'Triton Pantry Tracker', an online tracking system for the UCSD Triton Food Pantry. It allows students to track and view the availability of the food items. Used React.JS for efficient prototyping of a website that has an interactive, dynamic user interface and high functionality. Also developed an AI chatbot (using Google Dialogflow) for users to ask and receive answers to basic FAQ about the pantry.

Undergraduate Honors Thesis (July 2020 - May 2021)
Supervisor: Associate Professor Caroline Lee, National University of Singapore (NUS)
Project: Machine Learning to Predict Methotrexate Response in Rheumatoid Arthritis Patients Using Clinico-Genetic Features

Class-Based Research Project (September 2019 - December 2019)
Supervisor: Associate Professor Jen-Wei Lin, Boston University (BU)
Module: CAS NE 445 Cellular & Molecular Neurophysiology
Project: Pharmacological Manipulation of Excitatory Post-Synaptic Potentials (EPSPs) at the Crayfish Neuromuscular Junction (NMJ)

Research Grant Proposal (September 2019 - December 2019)
Project: Investigating the differential role of insulin in the amyloidogenic and non-amyloidogenic APP processing pathways
Module: CAS NE 535 Translational Research in Alzheimer's Disease [Boston University]

Undergraduate Research (May 2019 - August 2019)
Supervisor: Assistant Professor Seow Wei Jie, National University of Singapore (NUS)
Projects: Public Knowledge, Attitudes and Perceptions of Air Quality in Asia; Systematic Review & Meta-analysis on Lung Cancer

Undergraduate Research (June 2018 - November 2018)
Supervisor: Professor Lim Kah Leong, Nanyang Technological University (NTU)
Project: Network Analysis to Identify Potential Molecular Links in Parkinson's Disease and Type II Diabetes

Class-Based Research Project (June 2018 - November 2018)
Project: Cloning of LDHA gene from mouse fibroblast cells into bacterial vectors for LDH protein expression in *E. coli*
Module: LSM2191 Laboratory Techniques in Life Sciences

Research Report and Proposal (January 2018 - April 2018)
Project: Investigating Dopaminergic Modulation of Striatal NPY-NGF Interneuron Circuitry
Module: SP2171 Discovering Science

Class-Based Research Project (February 2018 - April 2018)
Supervisor: Dr. Robert Lieu Zi Zhao, Lecturer, National University of Singapore; **Module:** SP2174 The Cell
Project: Effects of Surface Rigidity on Slime Mold Growth and Morphology

Research Proposal (September 2017 - October 2017)
Project: Investigating the Effect of Post-Transcriptional Regulation of DMT1 via IRE/IRP Regulatory System on α-Synuclein Protein Expression to Determine its Role in Parkinson's Disease

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SKILLS

Programming Languages: Python, C#, R, Java, MATLAB, SAS, SPSS, JavaScript, HTML, CSS, C

Libraries & Frameworks: ROS, Unity3D, Microsoft Azure, TensorFlow, Scikit-Learn, ReactJS, Arduino

Statistics & CS: Machine Learning, Deep Learning, Multivariate Statistical Analysis & Modelling, Functional Programming, Object-Oriented Programming, Software Engineering

Qualitative Analysis: Reflexive Thematic Analysis, Grounded Theory

Selected Laboratory Skills: Electrophysiology, Western Blotting, DNA/RNA Isolation and Purification, SDS-PAGE, Protein Assays, Cell Culture, Molecular Cloning, Fluorescence & Light Microscopy, RT-PCR