Achu Wilson
Full Stack Robotics Engineer

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EXPERIENCE

CARNEGIE MELLON UNIVERSITY | GRADUATE RESEARCH STUDENT
Sept 2021 – Current | Pittsburgh, USA

- → Advisor: Dr.Wenzhen Yuan
- → Developed **tactile driven manipulation primitives and skills** for cable routing and assembly tasks. (Publication - under review) **(video)**

ROBERT BOSCH CENTER FOR CYBER-PHYSICAL SYSTEMS, INDIAN INSTITUTE OF SCIENCE | RESEARCH ASSOCIATE
Sept 2020 – Sept 2021 | Bangalore, India

- → Advisors: Dr.Bharadwaj Amrutur, Dr.Shalabh Bhatnagar
- → Led Team MIT-IISc on the **Kuka Innovation Award - AI Challenge 2021**. **(video)**
- → Developed a two finger robot hand which has GelSight tactile sensing on the inner surface and close range proximity sensor array on outer surfaces. The **hand could perform in-hand object rolling thereby gathering tactile data over extended object surfaces** .
- → Explored reinforcement learning algorithms to explore and pick up objects in vision denied environments using tactile & proximity sensing data.
- → Model free **non-prehensile object manipulation using force control.** **(blog post)**

MASSACHUSETTS INSTITUTE OF TECHNOLOGY | CSAIL, VISITING RESEARCH STUDENT
October 2018 – October 2019 | Cambridge, USA

- → Advisor: Dr.Edward Adelson
- → Designed a **fully actuated robot hand with multi-sensory feedback**, including multiple GelSight tactile sensors. It involved design of the mechanical system, electronics and software for data capture and processing **(video)**

SASTRA ROBOTICS | CO-FOUNDER & C.T.O
August 2013 – Sept 2018 | Cochin, India

- → As the technical co-founder, **designed and built the drive systems, motion controllers and user software for SCARA and 6 axis robots** for device testing applications.
- → Developed robot force controllers to ensure safety of devices under test and a **sensorized finger to analyze the haptic feedback generated on touchscreens.**
- → Created computer vision systems to analyze device states from LCD screens, dials, switches, knobs etc
- → These robots **helped clients** (BOSCH, HCL, HoneyWell etc) **in reduction of device testing time by upto 70%.**

ASIMOV ROBOTICS (ENERGID TECHNOLOGIES) | ROBOTICS SOFTWARE ENGINEER
June 2012 – July 2013 | Cochin, India

- → Developed ROS & LabVIEW interfaces for Cyton Gamma 7DOF manipulator through Energid Actin framework.
- → Designed electrical subsystems, motor controllers and sensor interfaces for a humanoid social robot.
- → Implemented **ROS based manipulation pipeline for a custom bi-manual dexterous manipulator**.

AWARDS

2021	**Finalist Kuka Innovation Award 2021: Artificial Intelligence**
2019	MIT ProjX funding for side project
2018	Winner, India Innovation Growth Program (IIGP)
2017	Best First Line Entrepreneur Award 2017 from the State Chief Minister
2016	**First - IEEE ICRA 2016 Humanitarian Robotics Challenge (HRATC)**
2012	Best Undergraduate Project, also received TEQIP funding from Government of India

SKILLS

PROGRAMMING
Python• C/C++

LIBRARIES/FRAMEWORKS
ROS • OpenCV • Open3D • Drake • NumPy • PyTorch • Keras • LabVIEW •pyBullet • CoppeliaSIM

EMBEDDED SYSTEMS & ELECTRONICS
AVR • ARM Cortex M0/M4 • FreeRTOS • Eagle • KiCad • NI MultiSIM • PCB Schematic & Layout Design

DESIGN & FABRICATION
SolidWorks • FreeCAD • Machine Shop (Manual & CNC Lathe - Mill, Waterjet - Laser cutting) • Soft-Robotics Wetlab

EDUCATION

CARNEGIE MELLON UNIVERSITY
MASTERS MECHANICAL ENGINEERING - ROBOTICS AND CONTROLS
Sept 2021 - Present | Pittsburgh PA, USA

UNIVERSITY OF CALICUT
BACHELOR'S IN ELECTRONICS AND COMMUNICATION ENGINEERING
May 2012 | Calicut, Kerala, India

COURSEWORK

- Mechanics of Manipulation
- Statistical Techniques (RL) for Robotics
- Learning for Manipulation
- Robotic Manipulation - Perception, Planning, and Control
- Computer Vision
- Machine Learning & AI for Engineers (also TA-ed)

RESEARCH

Google Scholar -
scholar.google.com/citations?user=EQnhhaQAAAAJ

LEADERSHIP/SERVICE

- Reviewer RA-L, IROS, IEEE-RAM, AIR-2019
- Program Committee Member - Advances in Robotics (AIR-2019)
- Built and managed a technical team (R&D and Production) of 20 engineers at Sastra Robotics.
- Voting Member - Bureau of Indian Standards: Automation Systems Robotics Committee.
- Industry Member in drafting the Robotics Automation Roadmap for India, IEEE-SA Industry Connections Workshop 2017