Chanuka Lihini Tennakoon

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Portfolio : https://chanukalihini.github.io/chanuka.io

Education

M.Sc. in Mechanical Engineering *2019 - 2023*

University of Moratuwa *Sri Lanka*

- Research title: Development of a soft robotic gripper with multiple grasping patterns

B.Sc. (Hons) in Mechanical Engineering *2014 - 2018*

University of Moratuwa *Sri Lanka*

- Research title: A self-reconfigurable modular robot to help search and rescue missions

Publications

Published

C. L. Tennakoon, A. L. Kulasekera, R. A. R. C. Gopura and D. S. Chathuranga, "PneuNet Based Hybrid Soft Gripper for Multi-Shape Object Handling," in IEEE Access, vol. 12, pp. 190158-190168, 2024, doi: 10.1109/ACCESS.2024.3515265.

Tennakoon T.M.C.L., Kulasekara A.L., Chathuranga D.S., Gopura R.A.R.C, "Effect of geometrical parameters on PneuNet bending performance." 2021 20th International Conference on Advanced Robotics (ICAR), 2021, pp. 738-743, doi: 10.1109/ICAR53236.2021.9659425.

C.L. Tennakoon, A. L. Kulasekera, D. S. Chathuranga and R. A. R. C. Gopura, "Variable Stiffness Soft Actuator using Layer Jamming for Food Handling," 2022 Moratuwa Engineering Research Conference (MERCon), 2022, pp. 1-6, doi: 10.1109/MERCon55799.2022.9906262.

S. Himaruwan,**C. L. Tennakoon** and A. L. Kulasekera, "Development and Characterization of an Origami-Based Vacuum-Driven Bending Actuator for Soft Gripping," 2023 IEEE International Conference on Soft Robotics (RoboSoft), Singapore, Singapore, 2023, pp. 1-6, doi: 10.1109/RoboSoft55895.2023.10122080.

Lihini C., Kulasekera A., Chathuranga D. and Gopura R., "Soft robotics to ensure safe food handling," Bolgoda Plains Research Magazine, 2023, pp. 36-38, doi: 10.31705/BPRM.v3(1).2023.9.

Under Review

C.L. Tennakoon, S. Himaruwan, A. L. Kulasekera and D. S. Chathuranga, "Self-Reconfigurable Modular Robot - MORABOT," International Journal of Advanced Robotic Systems.

Research Experience

Development of a soft robotic gripper with multiple grasping patterns *2019 - 2023*

M.Sc. Degree by research *University of Moratuwa*

- Designed and developed a novel hybrid soft actuator and reconfigurable gripper for adaptive grasping.
- Implemented an ideal grasp detection system using visual feedback.
- Developed a variable stiffness actuator for safe and efficient handling of delicate objects.
- Advisors: Prof. R.A.R.C. Gopura, Dr. K.V.D.S. Chathuranga

Self-reconfigurable modular robot for search and rescue *2017 - 2018*

B.Sc. Final year research project *University of Moratuwa*

- Developed a self-reconfigurable modular robot for deployment in disaster rescue missions.
- Designed a vision based localization system using fiducial markers.
- Implemented self-assembly and disassembly mechanisms for adaptability in unknown terrains.

Projects

Design and development of an origami-based soft actuator *2023*

Project by Computational sensing and smart machines lab *University of Moratuwa*

- Developed a soft actuator inspired by origami folding structures.
- Investigated the effectiveness of different origami folding patterns in actuation.

Large scale 3D printing platform using a robot arm *2022*

Project by Dynamicslk (pvt) Ltd *Marine Mega Tech, Abu Dhabi*

- Developed a large-scale additive manufacturing system for marine vessel components.
- Integrated a KUKA KR 240 R2700 prime robotic arm with a PLA pellet extruder.
- Designed the control system to ensure seamless communication with the KUKA KR C2 controller.

Design of a continuum robot arm for pipe inspection *2023 - 2024*

Project by Dynamicslk (pvt) Ltd *Dynamicslk (Pvt) Ltd*

- Designed a continuum robot arm with tip-following control to navigate tight spaces.
- Designed a control system to improve precision and flexibility.

Work Experience

Lecturer (On Contract) *2024 - Present*

Faculty of Technology, University of Sri Jayawardenepura

- Conducting lectures in the Mechatronics specialization.
- Teaching topics related to mechatronics design, sensors and automation.
- Supervising final year students research work.

Mechanical Engineer - Founding Partner *2021 - 2024*

Dynamicslk (pvt) Ltd

- Led mechanical design and automation for projects, specializing in robotics, control systems, and product development.
- Designed and implemented custom automation solutions for industrial applications.
- Developed CAD models, structural analyses, and prototype testing for client projects.
- Managed interdisciplinary teams to deliver end-to-end engineering solutions.

Visiting Lecturer *2024 - Present*

ACBT Campus - Australian College of Business Technology *Sri Lanka*

- Teaching Computer-Aided Design (CAD) for Engineering, focusing on manual drawings and Bentley MicroStation.

Research Interests

Soft Robotics
Modular robots , Swarm robots
Bio-Inspired design
Robotic Manipulators

Expertise & Skills

Mechanical Design and Analysis : SolidWorks, AutoCAD, Abaqus CAE

Programming and Simulation : MATLAB, Python, Java, LabVIEW, PLC Programming

Graphic Design and 3D Animation : Blender, Adobe After Effects, Adobe Premere Pro, Photoshop

Prototyping and Control : Robotics, Mechatronics Systems, Automation