Siril Teja Dukkipati

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Education

McGill University — Montreal, CA
Ph.D. in Mechanical Engineering — *Jan. 2022 – Present*
Master of Science in Mechanical Engineering; Fast-track; ***CGPA: 4.0/4.0*** — *Sep. 2020 – Dec. 2021*

- *Research Interests:* Biomechanics, System Modeling, Mechanical Design
- *Thesis:* Biomechanical design and validation of a benchtop robotic spine with applications in chronic low back pain research

Manipal University — Manipal, IN
Bachelor of Technology in Mechanical Engineering; ***CGPA: 9.17/10.0*** — *Aug. 2016 – May 2020*

- *Specialization:* Mechanical Design
- *Thesis:* 3D-Printing of Self-Healing Soft Robots. *Done at Vrije Universiteit Brussel, Belgium.*

Experience

Musculoskeletal Biomechanics Research Lab, McGill Univesity — Montreal, CA
Graduate Research Assistant — *Sep. 2020 – Present*

- Development of a benchtop robotic spine model with focus on clinical validation of IDP and IMP under different loading scenarios and future applications in new spine prosthetics testing and validation.
- Developed the control system with GUI for the spine in MATLAB and LABVIEW for stabilization and testing. Integrated pressure, position, force sensors through NI-cDAQ system.
- Explored ways to test new spine stability theories with the developed spine model.

SURE Award Research Assistant — *May 2019 - Aug 2019*

- Pneumatic Artificial Muscle modeling and integration on the robotic spine with muscle pressure control in MATLAB and LABVIEW for stabilization

Department of Mechanical Engineering, McGill University — Montreal, CA
Teaching Assistant - MECH 290, 262 — *Sept 2020 – APR 2022*

- Responsible for conducting regular tutorials for a section of 40 students in the subject of Computer Aided Designing (290), Statistics and Measurements lab (262)
- Engaged regular classes, developed course material, exercises, assignments.

Vice President of Academics, GAMES — *June 2022 - Present*

- **G**raduate **A**ssociation of **M**echanical **E**ngineering **S**tudents (GAMES) represents all the Mechanical Engineering graduate students at McGill University.

R&MM Research Group, Vrije Universiteit Brussel - VUB — Brussels, BE
Research Assistant — *DEC 2019 – APR 2020*

- Worked on ways to achieve 3D Printing of Self-healing soft robotic grippers.
- Developed and prototyped a custom print head to facilitate 3D printing with temperature sensitive polymers like DPBM-FGE-FT5000.
- Developed and prototyped a hybrid soft gripper with self healing capability against any cuts due to sharp payloads.

Design and Analysis Lab, Manipal University — Manipal, IN
Research Assistant — *Sep 2019 – Dec 2019*

- Worked on 3D Reconstruction of Human Skull through patient specific CT imagery
- Finite element analysis of the effect of dental implants on skull sutures. Analysed the stress distribution at sutures of interest.

Mars Society South Asia — IN
Technical Director — *May 2019 – Apr 2021*

- Responsible for all the technical and space advocacy activities in all the 8 South Asian countries under MSSA.
- Responsible for the organization of yearly international space technology competitions like Indian Rover Challenge (IRC), International Planetary Areal Systems Challenge (IPAS) etc. under MSSA.

Advisory committee — *Apr 2019 - Present*

- Part of the Advisory committee to oversee various activities of the organization.

Projects

Mars Rover Manipal Dec 2016 – May 2019

- Worked as a Research lead for the team of 2019 leading a team of 4 undergraduate students in two robotic exploration related research projects - Autonomous bicycle, underactuated robotic gripper.
- Developed a Mars Rover Prototype with autonomous navigation, equipment servicing, astronaut assistance capabilities.
- Secured 1st place worldwide in the inaugural Indian Rover Challenge - IRC 2017, Vellore, India.
- Secured 7th place worldwide and 2nd in Asia at University Rover Challenge - URC 2018, Utah, USA.

Crawler Bot | *Perma Liner LLC.* May 2019 – Aug 2019

- Developed a crawler bot to navigate through pipeline systems with map based exploration and repair capabilities.
- Designed a novel drive system inspired by snake movements for the robot to be dexterous to negotiate tight bends.
- Managed a team of 12 undergraduate students throughout the project dealing with company negotiations, technical discussions etc.

Publications

[**1**] **Dukkipati ST** (2020), "A hybrid soft gripper with self-healing capability", Robotics, Intelligent Automation and Control Technologies - RIACT 2020, Vellore, IN. Selected for *Best Paper Award*.

[**2**] **Dukkipati ST** (2020), "Self-Healing Soft Robotics: Design Prototyping of a Self- Healing Soft Gripper", Thesis work for Bachelors degree in Mechanical Engineering at Manipal Institute of Technology, IN.

[**3**] **Dukkipati ST** et al. (2019), "Implementation of the control system on a robotic spine & Validation of the benchtop model", Poster presentation, SURE 2019, McGill University, CA.

[**4**] **Dukkipati ST** et al. (2018), "Design and analysis of underactuated gripper using Chebyshev lambda mechanism with slip preventive strategy for fragile objects", ICAARS 2018, Coimbatore, IN and Manipal Research Colloquium 2018, Manipal, IN.

Technical Skills

Languages: MATLAB, LABVIEW, Python, C/C++, HTML
Design: Catia, SOLIDWORKS, AutoCAD, Fusion 360
Analysis: Ansys Mechanical APDL & Workbench, Adams
CAM: Fusion 360 Machining, MasterCAM; Cura, Prusa & FormLabs printers for 3D Printing

Awards & Achievements

- Fonds de recherche du Québec – Nature et Technologies (FRQNT) Masters Research Scholarship 2022, Montreal, CA.
- McGill Engineering Doctoral Award (MEDA) 2022, McGill University, Montreal, CA.
- Graduate Excellence Award 2020, McGill University, Montreal, CA.
- Best Paper Award - RIACT 2020 Conference, Vellore, IN.
- Rubin Gruber SURE Award 2019, McGill University, Montreal, CA.
- Manipal Scholar Award-2016-17, Manipal University, IN.

Certifications

- Workplace hazards - WHMIS 2015 Certified.
- English proficiency - IELTS Certified.