

BHARGAV KONIDALA

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PROFESSIONAL SUMMARY

- Mechatronics Engineer with hands-on Canadian research experience at the university of Ottawa, specializing in Robotics, Industrial Automation, and Control Systems.
- Proven expertise in Mechanical Design, Embedded Systems, PLCs, and Mathematical Modeling.
- Strong autonomous problem-solving skills and collaborative experience within multidisciplinary engineering teams in academic and industrial settings.

TECHNICAL SKILLS

- **Programming Languages:** Python, C/C++, R, MATLAB
- **Mechanical Design:** SolidWorks, CATIA, AutoCAD, Siemens NX, ANSYS, CNC Programming
- **Robotics:** ROS, Gazebo, MuJoCo, RAPID Programming and RobotStudio for ABB Robots
- **Simulation Tools:** Simulink, NI LabVIEW, Wolfram Mathematica
- **Industrial Automation:** PLC/HMI (Siemens, Allen-Bradley, Bosch-Rexroth), SCADA, Sensor Technology, Communication Networks and Protocols, Actuators, Industrial Control Systems

WORK EXPERIENCE

Independent Robotics Researcher

January 2024 – Present

Advisor: Dr. Davide Spinello, University of Ottawa, Ottawa, Ontario

- Advance research on multi-legged autonomous robot locomotion, resulting in one peer-reviewed conference publication, with a journal manuscript currently in development.
- Pursue self-directed learning in ROS-based robotic systems and autonomous motion planning to deepen capabilities in intelligent system design.

Graduate Teaching Assistant – Control Systems

January 2021 – April 2021

Faculty of Engineering, University of Ottawa, Ottawa, Ontario

- Prepared and delivered weekly concept reviews to 50+ undergraduate students in System Dynamics and Control Theory, receiving excellent feedback for simplifying complex topics.
- Hosted 40+ office hours for individualized student support, while using MATLAB, Simulink, Python, Arduino Uno, and Raspberry Pi platforms for demonstrations and projects.

Mechatronics Engineering Intern – Emission Control Systems

December 2018 – June 2019

Bosch, Bengaluru, India

- Led and accelerated Requirements Engineering by 2 months for a Urea quality sensor in Urea-SCR vehicle emission treatment systems via rapid product research and documentation.
- Expedited Urea-SCR control module validation timeline by 25% through coordination with calibration teams and priority execution of test cycles.
- Assembled and configured a functional test bench to execute 50+ test cycles on a Urea-SCR control module to collect diagnostic logs and sensor response data for analysis.
- Customized 10+ CAD models of Bosch Denoxtronic components, under the guidance of a mentor, adapting designs to meet unique client specifications.

Field Service Intern – Industrial Automation

April 2018 – July 2018, April 2017 – July 2017

Kistler-Morse Automation, Hyderabad, India

- Assembled, tested, and commissioned 10+ industrial automation units using pre-integrated PLC systems; configured I/O modules, relays, sensors, and electrical hardware per system schematics.

- Resolved 50+ system issues on-site, including communication failures, mechanical misalignments, sensor calibration errors, and control logic faults through agile troubleshooting.
- Ensured 100% functionality during dry runs and final deployment by liaising directly with third-party engineering teams to modify embedded PLC logic on-site.

ENGINEERING PROJECTS

Master's Thesis: Locomotion Mechanics of an Autonomous Robot

May 2020 – May 2023

Graduate Research Assistant, University of Ottawa, Ottawa, Ontario

- Derived the system dynamics of a biologically inspired multi-legged robot and constructed a simulation environment in Wolfram Mathematica to assess robot performance and deploy different control strategies.
- Leveraged a mechanically coupled array of elastic filaments as legs to potentially minimize the energy consumption and improve locomotion efficiency of the robot.

Control of Pneumatic Artificial Muscles

July 2018 – December 2018

Undergraduate Research Assistant, Manipal Institute of Technology, Manipal, India

- Designed a test platform for research on data-based modeling of pneumatic muscles and comparing results with 6 existing mathematical models.
- Integrated flex sensors with a machine vision system to capture dimensions of the pneumatic muscles, while using Siemens S7 PLC with Bosch-Rexroth pneumatic systems for controlling the muscles.

ABB IRB 1600 Vision Guided Sorting System

April 2018

Lab Project, Manipal Institute of Technology, Manipal, India

- Implemented a vision guided robotic sorting system using an ABB IRB 1600 robotic arm to detect, identify, and sort a group of objects into pre-defined distinct categories.
- Calibrated the machine vision system through RobotStudio, achieving 99% accuracy in object recognition; wrote a custom RAPID code to program the motion of the arm.

Industrial Process Automation

November 2017

Lab Project, Manipal Institute of Technology, Manipal, India

- Programmed a Siemens PLC controlled automation system simulating a 4-station industrial manufacturing line with distribution, handling, processing, and buffering stations.
- Implemented control logic using both Ladder Logic and Structured Text to process data from 9 sensors and ensure precise inputs through 8 actuators.

EDUCATION

Master of Applied Science in Mechanical Engineering

November 2023

University of Ottawa, Ottawa, Ontario

Specialization: Robotics and Control

Thesis Supervisor: Dr. Davide Spinello

Coursework: Robotics, Nonlinear Systems Analysis, Advanced Dynamics, Finite Element Analysis

Bachelor of Technology in Mechatronics Engineering

June 2019

Manipal Institute of Technology, Manipal, India

Minor: Robotics and Industrial Automation

Coursework: Mechatronic Systems Design, Linear and Digital Integrated Circuits, Embedded Systems, Design of Machine Elements, Data Structures and Algorithms, Machine Learning, Artificial Intelligence

PUBLICATIONS

Spinello, D., & Konidala, B. (2024, July). Towards metachronal coordination of coupled flexible filaments for terrestrial robot locomotion. In 2024 American Control Conference (ACC) (pp. 5320-5326). IEEE.