DIVYANSH GUPTA

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EDUCATION

Northeastern University - Boston, USA
Masters in Robotics (GPA: 3.926) September 2022 – Present
Courses: Control System Engineering, Robot Sensing and Navigation, Machine Learning, Legged Robotics

Indian Institute of Technology Roorkee (IIT-R), India
B. Tech. Mechanical Engineering (*First division - 83.7%)* July 2016 – May 2020
Relevant courses: Robot Mechanics and Control, Dynamics of Machines, Automatic Control, Algorithms and Analysis

TECHNICAL SKILLS

- **Programming Acumen:** C++, Python, ROS, MATLAB, Arduino IDE
- **Design and Prototype:** CAD (SolidWorks and Fusion360), 3D Printing (FDM and SLA)
- **Modeling and Simulation:** MATLAB – Simulink, Simscape, MuJoCo

WORK EXPERIENCE / INTERNSHIPS

Ottonomy Inc., India | Robotics Design Engineer *March 2021–May 2022*
Last-mile Autonomous Delivery Robots

- Designed sheet metal and plastic parts as per DFMA for robot electro-mechanical integration and improving manufacturability; reduced integration and maintenance time for electronics-hardware by 40%
- Devised and prototyped (5-concepts) attachments to facilitate robot's navigation in snowy-terrains (up to 6in)
- Implemented thermal management system to enable operations in outdoor-environments (-5^{o}C - 45^{o}C)
- Prototyped mechanisms and sensor systems for testing software and hardware interaction

Indian Institute of Science, Bangalore, India | Research Assistant *May 2019-July 2019*
Insulin Pump for T1D1 patients

- Developed a novel transmission system using double-pawl ratchet, to facilitate discrete actuation of 5µm
- Theoretically modeled and experimentally validated the plunger force required for subcutaneous injections

The Hitech-Robotic Systemz, Gurgaon, India | Summer Intern *May 2018-July 2018*

- Developed a compliant parallel jaw gripper for EOD operation with Gripping Load: 12Kg and Size: 100mm
- Identified the root cause for Gear chipping in Robot Arm, by simulating dynamic loading of gear train

PROJECTS

Design and Control of Ankle Exoskeleton | Research Assistant | Shepherd Lab October *2022-Present*

- Optimizing the design parameters of ankle exoskeleton to minimize metabolic cost from system weight
- Modeling and analyzing impact of spring coefficient in Series Elastic Actuators on system dynamics

Sensing and Navigation | Northeastern University *September 2022-Present*

- Estimated stability of IMU using Allan Variance analysis and modeled sensor unit for these noise parameters
- Developed python-based driver in ROS for collecting Inertial and GPS (RTK and RTK-OFF Mode) data
- Implemented dead reckoning and velocity estimation using Kalman Filter based sensor fusion of IMU and GPS

Wearable sensors for predicting knee osteoarthritis | Prof. Shailesh Ganpule, IIT Roorkee *July 2019-May 2020*

- Prototyped a wireless sensor system using NodeMCU and MP9250 to collect gait data and joint kinematics
- Designed algorithm to predict healthy/osteoarthritic knee using gait features and lower body kinematics

Legged Robot – "Chitrak" | Models and Robotics Section, IIT Roorkee *Jan 2018-Dec 2018*

- Designed and tested a 2-DOF leadscrew based self-locking leg design for a Quadruped robot
- Simulated cubic Bezier curve-based foot trajectory and implemented a position-controller for tracking

ACTIVITIES AND AWARDS

- Medical Device Hackathon for Geriatric Health: 2nd runner-up in Hackathon organized at IISc (2019)
- 8th Inter-IIT Tech Meet- BETIC Medical Innovation Challenge: 2nd position for Redesigning crutches (2019)
- Annual Aquatics Meet (2017): 1st position in 4*100m Freestyle and 400m Medley swimming relay race
- Secretary – Models and Robotics Section (MARS), IIT Roorkee Robotics Society
- Team Leader – Unnat Bharat Abhiyan (UBA), IIT Roorkee - Indian Government Initiative for Rural Upliftment