DIVYANSH GUPTA

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SUMMARY

Dynamic robotics engineer with a passion for cutting-edge mechanical systems and a proven track record in electro-mechanical design, controls, and cross-functional collaboration. With over 1+ year of industry experience, I've successfully taken ideas from concept to production. Seeking internship to leverage my skills during January-August'24

EDUCATION

Northeastern University - Boston, USA
Master of Science in Robotics (GPA: 3.96) **Expected August 2024**
Courses: Control System Engineering, Robot Sensing and Navigation, Machine Learning, Legged Robotics

Indian Institute of Technology Roorkee (IIT-R), India
Bachelor of Technology in Mechanical Engineering **May 2020**
Relevant courses: Machine Design, Kinematics of Machine, Dynamics of Machine, Robot Mechanics and Control

SKILLS

- **Functional Skills:** Product Development, Rapid Prototype, Technical Documentation, Version control – Git, JIRA
- **Design and Prototype:** 3D Modeling (SolidWorks), DFMA, FEA, AutoCAD, GD&T, Additive Manufacturing
- **Software & Programing:** Linux, C++, Python, ROS, Matlab, Arduino, Simulink, MuJoCo, Microsoft Office
- **Libraries:** Computer Vision - OpenCV, ScikitLearn, TensorFlow, Keras, PyTorch, Hyperopt

WORK EXPERIENCE

Research Assistant | *Shepherd Lab*, Northeastern University, Boston **October 2022 – Present**
Design and control of an Ankle Exoskeleton

- Designed unidirectional series elastic actuator with 60Nm peak torque and applied controller with Raspberry Pi
- Developed composite flexures for passive range of motion and optimized structure for stiffness and mass
- Developing non-linear spring behavior using CAM mechanism for smooth transition across ambulation modes
- *Course Assistant* (Wearable Robotics, Spring'23): Mentored 18 students on exoskeleton design and control

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

- Improved modularity and FOV of sensor units reducing maintenance time by 40% and increasing FOV by 10%
- Established testing protocol and improved thermal system design to enable operation in 20-120 °F temperature
- Drafted engineering drawings for intricate parts and assemblies, specializing in sheet metal fabrication process
- Supervised cross-functional team of robot technicians and planned workflow reducing integration time by 20%

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

- Designed novel transmission to facilitate discrete actuation of 5µm in smaller form-factor, reducing size by 30%
- Theoretically modeled and experimentally validated the plunger force required for subcutaneous injections

OTHER PROJECTS

Biped Controller for 3-link Planar robot | Northeastern University **January 2023 – April 2023**

- Achieved improved stability and natural gait for biped using hybrid zero-dynamics based controller design
- Designed an optimization-based foot trajectory using Bezier curves for energetically efficient walking gait

Analysis of sensor system in Autonomous Vehicles | Northeastern University **August 2022 - December 2022**

- Examined errors and approved theoretical results of PPK and RTK-GPS with RTK yielding 72% more accuracy
- Accomplished inertial sensor noise analysis using Alan Variance to measure frequency stability of IMUs

Redesigned Crutches | IIT-Roorkee (*Won 2nd Prize in Biomedical Innovation Challenge*) **July 2019 - May 2020**

- Prototyped a passive structural system to transfer 60% load from wrist to pelvis region in forearm crutches
- Tuned structural parameters by analyzing dynamic simulation of modeled system in Simscape-MATLAB

Legged Robot (Quadruped) | IIT-Roorkee **May 2018 - December 2018**

- Designed and prototyped a 2-DOF self-locking joint for a quadruped robot leg using leadscrew mechanism
- Simulated cubic Bezier curve-based foot trajectory and implemented a position-controller for foot tracking

LEADERSHIP ROLES

- ***Resident Assistant*** (Northeastern University): Managing and engaging a community of 25 residents
- ***Secretary*** (2019-20, IIT-R): Led a team of 24 at college robotics society (MARS) and mentored 10+ projects
- ***Team Leader*** (2018-19, IIT-R): Led a team of 35 as part of Indian government initiative for rural upliftment (UBA)