SOUMITRA SITOLE
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OBJECTIVE:
Seeking a dynamic opportunity in Mechatronics, Robotics and Control Systems Engineering to test and enhance my skills to solve real-world problems.

EDUCATION:
- PhD Mechanical Engineering – Mechatronics and Robotics: University of Massachusetts – Amherst [2018-Present]
- MS Mechanical Engineering – Dynamic Systems & Controls (GPA 3.7): University of Massachusetts – Amherst [2016-2018]
- BE – Mechanical Engineering - Design (First class with Distinction): University of Pune [2012-2016]

EXPERIENCE:

I. **Mechatronics and Robotics Research Lab (MRRL), UMass Amherst** - Research Assistanceship [06/2017-Present]
- Deep learning approaches for reducing human-robot teleoperation latency using different sensing modalities
- Real-time joint inverse kinematics for robot teleoperation using wearable position trackers
- Design and development of actuation system for fluid-powered gait assistance
- Custom tracker development and sensor integration using lighthouse virtual reality technology
- Performance evaluation for the lighthouse technology using forward kinematic solutions based on an industrial 7 DOF robotic arm
- Motion capture and joint variable quantification using inverse kinematics based on a phantom prosthetic limb

II. **HONDA Research Institute, Japan** – Internship [01/2019 - 04/2019]
- Direct teleoperation of humanoid robots
- Motion prediction and intent recognition for shared control

III. **TATA Motors, India** - Internship [06/2015 - 07/2016]
- Exploring cabin cooling solutions for air conditioning in hybrid electric vehicles employing the start-stop functionality
- Design, testing and characteristic evaluation of the electromagnetic clutch

PROJECTS:

I. **Research and Coursework Projects:**
- Supported Teleoperation (Collaboration with Honda R&D Tokyo, Japan) [2019-Present]
- Fluid Powered Manipulation for Human Gait Assistance and Rehabilitation (Collaboration with Fluid Structure Interactions Lab at UMass) [2020]
- Sensorized Prosthetic Alignment Read-Out Technology (Collaboration with FTL Labs) [2017-2020]
- Duckie Town Robot (Miniature self-driving vehicle) [2018]
- Stuart Robotic Vehicle – The Braitenberg photovore [2018]
- Roger the Crab – Robot control simulation [2018]
- Adaptive Control of Propeller Levitated Arm (Control Simulation) [2017]
- SIMM: Smart Injection Molding Machine (Design, Fabrication, Automation) [2017]
- Design Optimization and Control of Quadcopter (Propeller Efficiency Maximization and Weight Reduction) [2017]
- EMG-actuated Upper-body Limb Exoskeleton (Modeling and Simulation) [2016]
- Electromagnetic Clutch for Hybrid Electric Vehicles (Design, Testing and Evaluation) – (Internship at TATA MOTORS, Pune, India) [2016]
- Multi-speed Multi-stage Gearbox – Mechanical System Design (Independent Coursework Project) [2016]
- Advanced Driver Assistance Systems - (Literature Review & Benchmarking) - TATA MOTORS [2015]

II. **Individual Projects:**
- RC Electric Car Builds - OpenRC Electric Buggy, OpenRC Formula 1 [2022]
- FPV (First-person-view) Drone Design and Development [2022]
- Articulated Ironman Helmet [2021]
- 6 DOF Robotic Arm Development and Control [2021]
- Solid and Surface Modeling Projects (*https://grabcad.com/library?utf8=%E2%9C%93&query=soumitra%20sitole*)

- Optimization algorithms: Optimizing Bivariate functions using Newtons Method, Gradient Descent and Conjugate Gradient algorithms, Univariate search method. (*https://www.mathworks.com/matlabcentral/profile/authors/8709202-soumitra-sitole*)

SOFTWARE:
MATLAB, ROS, Python, OpenSim, Qualisys Motion Capture, C, C++, R Programming, Arduino, PTC Creo, SolidWorks, ANSYS, AutoCAD, Simulink, SteamVR, Unity, Android Studio, Microsoft Office

SKILLS:
CAD Modeling, 3D Printing, Embedded Systems, FEA, Statistical Analysis, Deep Learning, Optimization, Microcontroller and Microprocessor Programming, Digital Signal Processing

PUBLICATIONS:
- Application and Evaluation of Lighthouse Technology for Precision Motion Capture, IEEE Sensors Journal, 2020 – Soumitra Sitole, Andrew LaPre, Frank Sup (Published)
- Human Elbow Joint Kinematics Prediction using Electromyography, IEEE Transactions on Medical Robotics and Bionics – Soumitra Sitole, Takahide Yoshiike, Frank Sup (Submitted – Under Review)
- Continuous Human Joint Mechanics Prediction – A Comprehensive Review of Model-based and Model-free Approaches, IEEE Transactions on Biomedical Engineering – Soumitra Sitole, Frank Sup (Under Review)
- Hybrid Deep-Learning Approaches for Improved Accuracy and Robustness for Motion Prediction using EMG, IEEE Transactions on Medical Robotics and Bionics – Soumitra Sitole, Takahide Yoshiike, Frank Sup (In-Progress)
- Design Optimization of Custom Wearable Trackers using Lighthouse Technology, IEEE Sensors – Soumitra Sitole, Seonhun Lee, Frank Sup (In-Progress)

CERTIFICATIONS:
- FAA – Part 107 Exemption (TRUST- The Recreational UAS Safety Test)
- Interfacing with the Arduino (UC Irvine: M3XJGVRUX23Z) [2016]
- The Arduino Platform and C Programming (UC Irvine: XY5KNPBMDUTU) [2016]
- Introduction to Computer Science and Programming Using Python (MIT, USA: dad0c716430946f5b0cd7636eec225cf) [2016]
- PTC Creo Parametric for Design Engineers (PTC University, USA: PTC209-0475) [2015]