Aditya Mehrotra

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EDUCATION

Worcester Polytechnic Institute – Worcester, MA, USA — May 2023
Master of Science in Robotics Engineering — 4.0/4.0
Coursework: Computer Vision, Deep Learning, Artificial Intelligence, Robot Dynamics, Controls

Manipal Institute of Technology – Manipal, India — Nov 2019
Bachelor of Technology in Mechanical Engineering
Minor Specialization in Design

SKILLS

Engineering: Fusion 360, SolidWorks, CATIA, AutoCAD, Ansys, FluidSim, 3D Printing
Robotics: ROS, Eigen, PyTorch, TensorFlow, OpenCV, Open 3D, Open Gym, Sci-Kit Learn, PyGame, Blender
Simulation Software: Gazebo, RViz, Webots, CoppeliaSim, Unity 3D, AMBF
Electronics: Arduino, Raspberry Pi, Nucleo, Micro:bit, 8085 MPU, ATmega8, NI MultiSim, Eagle
Programming: C++, Python, Java, C, Matlab, Linux, Git, Latex, Visual Basic, HTML
Others: Photoshop, Illustrator, Flash, Premiere, Microsoft Office (Word, Excel, PowerPoint)
Languages: English (Fluent), French (Intermediate A2), Spanish (Intermediate A2), German (Elementary A1), Hindi (Native)

INDUSTRY EXPERIENCE

Boston Scientific – Worcester, USA — Jan 2022 - Present
Graduate Research Assistant — PracticePoint, WPI
• Developing a surgical device with the KUKA LBR iiwa. [Work protected by NDA]

Miko – Mumbai, India — Apr 2021 - Aug 2021
Robotics Engineer – I — Robotics Division
• Simulated robot motion and modules of the two product versions of an autonomous social robot on Webots
• Implemented PID control and Odometry on the robot
• Added modules and maintained a Java-based utility software

BaseApp Systems – Delhi, India — Mar - Apr 2021
Junior Robotics Engineer — Startup for Embedded Systems & Warehouse Robotics
• Explored Navigation Stack in ROS running on Raspberry Pi
• Prepared test guided path designs for Autonomous Guided Vehicles in warehouse environment
• Implemented an SMTP Server

Maruti Suzuki India Limited – Gurgaon, India — Jun - July 2018
Intern — Vehicle Inspection Department
• Prepared Work Instruction Sheets for inspection line technicians
• Surveyed inspection process to improve defect detection in finished vehicles

Seelen HealthTech Pvt Ltd – Manipal, India — Feb - Dec 2017
Product Development Intern — Startup for Oral Cancer Rehabilitation Device
• Created the model mechanism for the prototype
• Fabrication through milling and 3D printing techniques
• Provided support in PCB designing and clinical trials

Air India Engineering Services – Mumbai, India — Jun - July 2017
Trainee — Engine Overhauling Department
• Assisted in maintenance, repair and general overhauling of CFM56, GE90, & GEnX commercial airline engines

RESEARCH EXPERIENCE

École Polytechnique Fédérale de Lausanne – Lausanne, Switzerland — Sep 2019 - Aug 2020
& University of Applied Sciences and Arts of Southern Switzerland - Lugano, Switzerland — Feb - Aug 2020
Visiting Research Assistant — Mobots Group | Department of Education & Learning
• Explored and developed Image Object Detection techniques for a tangible programming platform
• Created an inexpensive Maker-based Educational differential-drive Robot with multiple sensors
• Designed & analyzed experimental studies, published multiple scientific papers

Zurich University of Applied Sciences – Winterthur, Switzerland — Jan - Sep 2019
Research Intern — Institute of Mechatronic Systems
• Optimized the design of an industrial Delta Robot, analyzed its working area and static stiffness
• Fabricated and commissioned a Fused Deposition Modelling Printer
• Prepared a detailed report on the undertaken projects | dx.doi.org/10.13140/RG.2.2.25342.10568

Manipal Institute of Technology – Manipal, India May 2016 - Jun 2018
Undergraduate Research Assistant Biomedical Lab
- Developed the prototype of a gesture-controlled robotic arm | dx.doi.org/10.13140/RG.2.2.25650.84169
- Developed a multi-level 3D game for the therapy of Tremor patients | dx.doi.org/10.13140/RG.2.2.24811.98085
- Provided support for the development of a surgical fluid collection device

PUBLICATIONS

Mehrotra, Aditya, et al. "***Accessible Maker-Based Approaches to Educational Robotics in Online Learning.***" IEEE Access 9 (2021): 96877-96889.| doi.org/10.1109/ACCESS.2021.3094158

Mehrotra, Aditya, et al. "***Introducing a Paper-Based Programming Language for Computing Education in Classrooms.***" Proceedings of the 2020 ACM Conference on Innovation and Technology in Computer Science Education. 2020. dl.acm.org/doi/pdf/10.1145/3341525.3387402

PROJECTS

Video Instance Segmentation using MaskTrack R-CNN Mar 2022 - Present
- Implementing Object Propagation via Attention Model using the YouTube VIS, COCO Dataset with PyTorch

Mini projects Dec 2021- Present
- Designed Deep Neural Network with Tensorflow on the Fashion MNIST to achieve 91% accuracy
- Visualizing LiDAR and Image data on the KITTI dataset
- Designed a Fuzzy Inference-based controller for a 2D cartpole
- Implemented a Deep Reinforcement Learning architecture for 2D cartpole control
- Developed and simulated 3R Planar Manipulator Kinematics with P control on PyGame
- Designing State Feedback Control with trajectory tracking for an RRBot Robotic Arm on Gazebo

Incremental Structure from Motion Sept - Dec 2021
- Calibrated camera intrinsic parameters, implemented feature tracking, estimation of the camera essential matrix
- Implemented Triangulation, PnP algorithm, bundle adjustment optimization to create a sparse 3D reconstruction of scene with Open3D

Inverse Dynamics Controller for the da Vinci Research Kit Sept - Dec 2021
- Modeled Forward & Inverse Kinematics for multiple models of the Patient Side Manipulator (PSM) of the da Vinci Research Kit
- Developed ROS nodes on C++ to communicate with the simulator Asynchronous Multi-Body Framework (AMBF)
- Implemented Inverse Dynamics control for gravity compensation

Machine Learning for Computing Education Sept - Dec 2021
- Preprocessed dataset using the Sci-Kit Learn & ProgSnap2 library and extracted relevant features
- Modeled students' cognitive knowledge by developing regression models and predicted performance
- Authored a paper on the results

Lower Limb Active Orthosis Exoskeleton May 2016 - Jun 2018
- Designed multiple 2 DoF mechanisms with linear electromechanical actuators on CAD, and modeled mechanism kinematics
- Programmed an open-loop controller for the gait and wireless joystick control with C++
- Fabricated the mechanical prototype with lightweight construction and rapid prototyping techniques
- Designed and fabricated PCB inhouse
- Led the team to the National Showcase of DRUSE 2018 organized by Defense Research & Development Organization (DRDO) of India | doi.org/10.13140/RG.2.2.23577.24169

Mars Rover Manipal Aug 2017 - Jan 2018
- Management Head for the Mars Rover Student Team the University Rover Challenge
- Organized events, sourced components, sponsorships, managed funds and administration

Engineers Without Borders Jan 2017 - Dec 2018
- Conducted a "SolidWorks for Beginners" workshop for professionals
- Conducted literacy survey in economically deprived communities around Udupi, Karnataka

AWARDS

• 8th International position	University Rover Challenge	Jun 2018
• National Qualifier Funding	Defense Research & Development Organization of India	May 2018
• State Qualifier Funding	Defense Research & Development Organization of India	Jan 2018

MEMBERSHIPS

• Engineers WIthout Borders	Sept 2016 - Nov 2019
• International Association for the Exchange of Students for Technical Experience	Oct 2017 - Nov 2019
• IECSE (Computer Science Engineering Club), Manipal, India	Sept 2016 - Nov 2019
• The Astronomy Club, Manipal	Jan 2017 - Nov 2019