Aditya Mehrotra

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EDUCATION

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

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

SKILLS

Robotics: PyTorch, CUDA, OpenCV, OpenMMLab, Open3D, Open Gym, Sci-Kit Learn, ROS, Eigen, oneTBB, GoogleTest
Programming: C++, Python, MATLAB, Java, Linux, Git, PerForce, Latex, Docker, AWS
Simulation Software: , OpenGL, Gazebo, RViz, Unity, Webots, CoppeliaSim, AMBF, PyGame, Blender
Electronics: Raspberry Pi, Arduino, Nucleo, Micro:bit, 8085 MPU, ATmega8, NI MultiSim, Eagle
Languages: English (Fluent), French (Intermediate A2), Spanish (Intermediate A2), German (Elementary A1)

EXPERIENCE

Amazon Robotics – North Reading, MA — Jan 2023 - Present
Perception SDE Co-op — Scene Perception
- Formulating algorithms for item state tracking in Sparrow robot workcell through multi-modal identification
- Leveraging vision transformer-based Dino model for generalizable feature extraction
- Building pipeline, service, imaging algorithm packages (Hungarian assignment), tests, and multithreading in modern C++

MathWorks – Natick, MA, USA — May - Aug 2022
AI Software Intern — Controls Applications and Charting
- Prepared Requirement and Functional Design Specifications for a high-priority fuzzy clustering enhancement
- Implemented and tested the Gustafson-Kessel algorithm for the 2023a release of the Fuzzy Logic Toolbox on MATLAB
- Developed a MATLAB Example on Brain Tumour MR Image Segmentation using clustering techniques

Boston Scientific – Worcester, MA, USA — Jan - May 2022
Graduate Research Assistant — PracticePoint, WPI
- Developed cartesian velocity control for KUKA LBR iiwa on MATLAB and ROS communicating with Java Sunrise controller

Miko – Mumbai, India — Apr 2021 - Aug 2021
Robotics Engineer – I — Robotics Division
- Simulated robot motion and modules with multi-threading for 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
- Pioneered Robotics Navigation at the firm in ROS running on Raspberry Pi 3
- Prepared test guided path designs for Autonomous Guided Vehicles in warehouse environment

École Polytechnique Fédérale de Lausanne – Lausanne, Switzerland — Sep 2019 - Aug 2020
Visiting Research Assistant — Mobots Group
- Explored and developed Image Object Detection techniques for a tangible programming platform
- Created an inexpensive Maker-based Educational differential-drive Robot, published multiple papers

PROJECTS

Exploring Transfer Learning for 3D Object Detection — Sept 2022 - Present
- Explored the VoxelNet, SECOND and PointPillars networks on PyTorch with the MMDetection3D framework
- Experimented with cross testing and tuning learning rates with the KITTI and nuScenes dataset

Video Instance Segmentation using MaskTrack R-CNN — Mar - May 2022
- Explored attention-based mechanisms in the FPN and inter-frame affinity to improve mask propagation for end-to-end video instance segmentation
- Compared results to the YouTube-VIS benchmark using the MaskTrack R-CNN pipeline and MMDet toolbox on PyTorch

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

Mini projects — Dec 2021- May 2022
- Generare fake images using a GAN architecture with TensorFlow on the MNIST, CIFAR-10 datasets
- Implemented a Deep Reinforcement Learning architecture for 2D cartpole control

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