# SAMEER MALIK

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## EDUCATION

**Worcester Polytechnic Institute - USA** | *M.S. Robotics* *Aug 2021 - Dec 2022*
**Jamia Millia Islamia - India** | *Bachelor of Technology, Mechanical* *Aug 2014 - Jun 2018*

## RELEVANT SKILLS

- **Programming Languages**: Python, Java, C++, JavaScript, MATLAB
- **Tools**: TensorFlow, AWS, OpenCV, PyTorch, ROS, CUDA, Docker
- **Framework/Packages**: Numpy, Pandas, Matplotlib, Scikit-learn, PCL, 3D Parsers, Ray Tracing, Web Dev Stack

## WORK EXPERIENCE

**Senior Software Engineer - ML Applications, Velodyne LiDAR** *Jan 2023 - Present*
- Developing automatic calibration pipelines for LiDAR using deep learning perception and multi camera systems. (CalibDNN, LCCNET)
- Design and development of software and architecture for automated testing stations using machine vision for robots. (Python, AWS)
- Development of point cloud parser and code optimizations to improve computer vision's inference speed on edge devices.(Cuda,C++)

**Machine Learning and Camera Intern, Motional** *Sept 2022 - Dec 2022*
- Formulated changes in the classification metrics (accuracy, precision,etc) for color gamuts on production deployed deep learning model for street lights detection and recognition. (Model:ResNet,Framework: PyTorch and Tensor RT)
- Delivered synthetic dataset of 100K images for experiments and improvement of detection's accuracy even with flares in images.(ISP)

**Image Processing Intern, Velodyne LiDAR** *May 2022 - Aug 2022*
- Implemented automation of Lidar's intrinsic Calibration and Camera Systems Integration, reduced operation time by 90 percent.
- Extended features of proprietary SDK and machine learning algorithms for perception's stack on object's detection and segmentation. (TensorFlow, Classical CV, 3-D Data)

**Software Engineer, HSBC** *Jul 2018- Jun 2021*
- Implemented and tuned machine learning models for dimensionality reduction, feature extraction, data selection, and Time-Frequency analysis to improve customer investments.(Statistical Machine Learning, Java, C++)
- Developed facial scanners, activity classification, and recognition systems for ATMs and personal banking apps. (ML Vision Models)
- Integrated machine learning models to automate 100 call centers in the Asia Pacific region, with AI agents along with development of deep learning services on cloud with Terraform infrastructure. (MLOps, Docker, AWS, JavaScript)

**Machine Learning Intern, Omnipresent Robot Tech** *May 2017-Jul 2017*
- Developed region based CNN model for drones feed for timely detection of gas leaks & damage in oil refinery. (Embedded CV)
- Supported perception's development for optimized Graph-based methods for automated vehicles to enhance their navigation. (ADAS)

**Research Intern, ASET Research Institute** *Dec 2016- Feb 2017*
- Implemented sensor fusion of world's first production mind controlled wheelchair "Samarth" & prosthetics's design. (Sensors, Linux)
- Advanced system's EEG signal optimization along with the classification of muscles movements using SVM. ( Supervised ML, Signals )

## KEY PROJECTS

**Depth Estimation for Stereo Images Using Deep Learning|** *PyTorch, VGG16* *Feb 2022- May 2022*
- Enhanced disparity and depth maps on occluded and highly textured images using PSMNET and added ASPP module to architecture.
- Worked on Cityscape dataset with same architectural changes along with experimental changes to other SOTA architectures.

**Implementation of RL Algorithms and Games|** *Open AI, Python, Cython* *Dec 2021- April 2022*
- Programmed model free and model based algorithms like Policy Gradient, Q Learning, SARSA, DQN, MDP, TD, Dynamic Programming, Monte Carlo to develop intelligent agents.Developed agents able to play games like Breakout and Lunar Lander.

**Machine Learning Algorithms Management System|** *JavaScript, Python, ML Models* *Oct 2021- Jan 2022*
- Developed a web based hierarchical ontology system for machine learning algorithms highlighting hardware resources constraints.
- Users can provide machine learning codes and implementations for various algorithms along with performance on their systems.

**Multi Object Tracking for Autonomous Driving |** *DeepSort, CNN, YOLO, HOG* *Oct 2021-Dec 2021*
- Surveyed available DL architecture for detecting vehicles and pedestrians from images and compared with classical feature detectors.
- Explore tracking-by-detection approaches using geometric computer vision, deep learning models and Kalman Filters and joint detection and tracking approaches using DEFT and FairMOT as baselines.

**Customer Sentiment Analysis |** *NLP, Splunk, Data Modeling* *Aug 2019- Aug 2020*
- Utilised social media and bank's kiosk feedback to predict the effects of bank's policy on customers.
- Integrated gesture recognition to improve and extend the software functionality and use cases, achieving 80% accuracy

## RESEARCH EXPERIENCE

**Research Assistant, Medical Fusion Lab, WPI** *Jan 2022- Oct 2022*
- Development of prediction models for Metacarpophalangeal Joint Angles and Classification of Hand Configurations Based on Forearm's Ultrasound. Future plan to implement controlled motion in AR to be utilized in industrial machine's or personal gadget's control. (VGG16, Sensors)

**Graduate Student, Google** *July 2022- Oct 2022*
- First Cohort for ML community to discuss and implement projects with Google engineers, provided support for deep learning certification. (TensorFlow)