Harsh Bharat Kakashaniya

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Education

- **University of Maryland** — College Park, MD
  Master of Engineering, Robotics; GPA: 3.92 — *Expected May 2020*
- **MIT College of Engineering** — Pune, India
  Bachelor of Engineering, Mechanical Engineering; (First Class with Distinction) — *Aug. 2012 – July. 2016*

Experience

- **ARCBEST technologies** — Fort Smith , AR
  Robotics Engineer Intern — *May 2019 - Present*
  - **Multi-agent Planning in Warehouse Environment**: Successfully designed pipeline for simultaneous motion of robot with dynamic collision avoidance.
  - **Bi-directional Path planning**: Implemented and Tested bidirectional path planning algorithms on vehicle with differential constraints for warehouse dynamic environment.
  - **Position estimation using computer vision techniques**: Designed and tested algorithm for orientation estimation using camera for robot attachment.
- **Maryland Robotics Center** — College Park , MD
  Research Assistant — *Sep 2018 - Apr 2019*
  - **Robotics in Hydroponics System**: Designed and built a system to cultivate leafy vegetables under water(piping system) with robotic automation of automatic picking and inspection system.
- **ACG Worldwide** — Pune, India
  Design Engineer — *July 2016 and Aug 2018*
  - **Robotic Pick-and-Place**: Developed "Robotic Pick-and-Place" (3D SCARA of RRP type) resulting in a market revolution; we were the first company in India to have a robotic transfer system. Showcased it in 'P-Mech 2018'.
  - **Biscuit Packer**: Launched a Special Biscuit transfer attachment for packing 110 biscuits per minute which led to opening of completely new business avenue for ACG in the FMCG market.
  - **Value addition and Value Engineering**: Led 'Value addition and Value Engineering' in the Design department which caused a high reduction in overall costs due to the design optimizations.
  - **Operational Excellence**: Improved output efficiency by 15% yielding a record break in the total number of machines produced by the company in Sep'16.

Programming Skills

- **Languages**: Python, C++, Linux, ROS , PCL, OpenCV, TensorFlow , Keras, Sklearn, OpenAI
- **Software**: Pro-E, SolidEdge, SolidWorks, Gazebo, Rviz, Geogebra, MATLAB, Ansys, LabView
- **Robotics**: Robot Motion Planning, Software Development, Artificial Intelligence in planning, Robot Modelling, Deep learning, Algorithms, Advance Controls, Computer Vision, Machine Learning

Projects

- **Automating robotic solution for last-mile delivery**: TSP, Python/C++, ROS, Gazebo/AirSim
- **Localization of mobile robot in indoor crowded environment**: SLAM, Python/C++, ROS, Gazebo
- **Path planning algorithms with differential constraints using turtle bot**: OpenCV,Python,ROS
- **Frontier Exploration**: RViz, C++, ROS, Gazebo, PCL
- **Design and simulation of a controller for Gantry Crane System**: PRM, Python
- **Roadmap Based Robot Motion Planning in Dynamic Environments**: RViz, C++, ROS, Gazebo, PCL
- **Modelling of fruit picking robot**: MATLAB, Solidworks
- **Traffic Sign Detection and Classification using MSER and SVM Model**: ML, OpenCV, Python
- **Color segmentation using Gaussian Mixture Models and EM Techniques**: OpenCV,Python
- **Visual Odometry for estimating trajectory of robot**: ML, OpenCV, Python
- **Detection and Tracking of AR Tags using Homography and Pose Estimation**: OpenCV, Python
- **Design of Algorithm for Lane Detection and Turn Prediction in Self Driving Cars**: OpenCV, Python
- **House price prediction using machine learning techniques(Kaggle)**: ML, Python