**Vishnu Prem**

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**EDUCATION**

**University of Pennsylvania,** School of Engineering & Applied Science *Philadelphia, PA*

Candidate for Master of Science in Engineering in Robotics *– GPA: 3.62/4* *May 2021*

*Courses: Design of Mechatronic Systems, Introduction to Robotics, Applied Machine Learning, Machine Perception, Learning in Robotics, Deep Learning for Data Science*

**Manipal Academy of Higher Education,** School of Engineering & IT *Dubai, UAE*

Bachelor of Technology in Mechatronics Engineering; minor: Robotics and Automation —*GPA*: *9.46/10 Oct 2018*

*Research Abroad*: University of Salford, UK in Spring 2018

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**EXPERIENCE**

**Amazon Lab 126** *Sunnyvale, US*

*Software Development Engineer Intern Jun 2020 – Aug 2020*

Implemented features for planning and control in the navigation stack for a new line of devices under development in the Advanced Technologies team. *C++17*

**GRASP Lab – University of Pennsylvania** *Philadelphia, US*

*Research Assistant Jan 2020 – May 2020*

Worked for a US Army funded DCIST collaborative research alliance project, implementing SLAM for multi drone navigation based on 3D point clouds from LiDAR scans. Implemented RRT\* to realize leap frog strategies, ie plan a path for a multi robot system that maps environments with insufficient unique features. *C++11, ROS, Python, OpenCV*

**Autonomous Systems and Advanced Robotics Research Centre - University of Salford** *Manchester, UK*

*Undergraduate Student Researcher- Guide: Theo Theodoridis Feb 2018 – May 2018*

Development of navigation stack for Pioneer P3DX robot**.** Incorporated 3D depth camera and deep learning for landmark detection, localization by triangulation and obstacle avoidance with sonar sensors. *Python, Java, OpenCV*

**Mimic Production** *Berlin, Germany*

*Robotics and Animatronics Intern*   *Mar 2019 – May 2019*

Developed software pipeline in embedded Linux platform for animatronic robot control. Designed hardware mechanism prototype for humanoid robot face. *Python, Raspberry Pi*

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**TECHNICAL SKILLS**

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| * *Software*: C, C++, Python, ROS, MATLAB, git | * *Libraries:* OpenCV, Eigen, Numpy, PyTorch |

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**Rao-Blackwellized Particle Filter for SLAM***(2020):* Implemented RBPF SLAM for indoor F1tenth autonomous car equipped 2D LiDAR and IMU. Generated maps based on data obtained from simulation.

***Semantic Segmentation of 3D LiDAR****(2020):* Developed deep learning models for segmenting Semantic KITTI dataset composed of annotated LiDAR data from a vehicular scenes.

***Unscented Kalman FIlter****(2020): UKF implemented for estimating roll, pitch and yaw based on data from IMU*

***3D Pose Estimation****(2020): Used image data to estimate the 3D pose of an object by key point detection.*

**FMT\* Planning framework for Autonomous Cars** *(2019):* Developed a ROS service node to serve as a global mission planner for Autonomous Vehicles that incorporates Fast Marching Tree algorithm in C++.

**Semi-Autonomous Battle-bot** *(2019):* Fabricated hardware and programmed microcontroller to localize robot using IR beacon in embedded C**.** Set up remote control via UDP and implemented PD control for autonomous navigation

**Chess Playing Robot** *(2017):* Developed computer vision algorithm using Python and OpenCV for detecting move made by human. Fabricated robot arm and wrote embedded software for robot arm control

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**ACTIVITIES & OTHER ACHIEVMENTS**

Volunteer Head of Mechatronics Department for annual tech festival Technovanza’17 at MAHE Dubai • 1st Place in ‘Institute of Physics’ Young Lecturer Competition ‘18 at Manchester Metropolitan University, UK • Best Actor Award at Interhouse Drama Competition ’14 SEPS, Abu Dhabi • Best Speaker at Interhouse Debate Competition’14 SEPS, Abu Dhabi

***References available upon request***