Kartik Madhira

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Research Interests: Perception and Planning under uncertainty for autonomous robots.

Education

- **University of Maryland** — College Park, MD
  Master of Engineering in Robotics — *August 2018 –*
- **Nirma University** — Ahmadabad, India
  Bachelor in Instrumentation and Control Engineering — *2013–2017*

Experience

- **Research Assistant:** — *with Prof. Yiannis Aloimonos*
  Computer Vision Lab, University of Maryland — *August 2018 – Present*
  Implementation of basic supervised deep learning model for optical flow for use on edge inference devices such as Intel Neural Compute Stick.
- **Trainee Decision Scientist**
  Mu Sigma Inc., India — *June 2018 – February 2018*
  Implemented ARIMA models for predictions of monthly and yearly sales using past inventory data. The client was an E-commerce major in the US specializing in footwear.
- **Research Assistant** — *with Dr. Dilip Kothari and Dr.Jignesh Patel*
  Nirma University — *August 2016 - August 2017*
  Clerkbot, a butler Robot: Developed a research platform for butler robot named Clerkbot. Researched on comparison of various out of the box ROS localization and mapping packages using the Clerkbot.
- **Research Intern**
  Tethrbox Technologies — *April 2016 - July 2016*
  Pedestrian Flow Counter Contributed to research on effective traffic estimator by developing a people counter prototype using a downward facing camera. The counter used background subtraction and euclidean distances between blobs in consecutive frames to achieve the up and down counts.

Publications

- **A quantitative study of mapping and localization algorithms on ROS based differential robot**: Kartik Madhira, Jignesh Patel, Dilip Kothari, Dipesh Panchal and Dhruv Patel, 2017 Nirma University International Conference on Engineering (NUiCONE), Ahmadabad, 2017, pp. 1-5 (Link)
- **Pedestrian flow counter using image processing**: Kartik Madhira, Aditya Shukla, 2017 International Conference on Energy, Communication, Data Analytics and Soft Computing (ICECDS), Chennai, 2017, pp. 1911-1915. (Link)
- **Self balancing robot using complementary filter: Implementation and analysis of complementary filter on SBR**: Kartik Madhira, Ammar Gandhi and Aneesha Gujral, 2016 International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT), Chennai, 2016, pp. 2950-2954. (Link)

Previous Projects

- **Clerkbot - A Butler Robot**: Built a prototype of office friendly Autonomous Fetch and Carry UGV (ROS Based)
- **Automatic Wall Painter - AGWallP**: Fully automatic slave Wall painting machine with directions to paint given from a dedicated Mobile App. Basic Structure contains a horizontal 2D plotter with pneumatic sprayer running at 12V.
- **Self Balancing Robot with Complimentary filter**: A self-balancing robot based on Complimentary Filter for the IMU Sensor(MPU-6050).
- **Line Follower Robot using PID algorithm**: A line following Robot, based on PID algorithm with online PID tuning with the help of push-buttons. Won 2 competitions using the robot.

Relevant Courses

- **CMSC 426 - Computer Vision**: Fall 2018 — *by Prof. Yiannis Aloimonos*
- **ENPM 667 - Control of Robotic Systems** : Fall 2018 — *by Prof. Waseem Malik*

Skills

Computer Languages: Python(proficient), C/C++(intermediate), R, LaTeX
Operating System: Linux, Mac OSX, Windows XP/7/8/10
Softwares: CLion, PyCharm, Jupyter, Eclipse IDE, Eagle, Matlab, RStudio, OpenCV(library), ROS (middleware)

References

Yiannis Aloimonos
Professor,
University of Maryland

Dr. Dilip Kothari,
Professor,
Nirma University

Prof. Sandip Mehta,
Associate Professor,
Nirma University