Kartik Madhira

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Research Interests: Perception and planning under uncertainty for autonomous systems.

Education

- **University of Maryland** College Park, MD
  Masters in Robotics *August 2018 –*
- **Nirma University** Ahmadabad, India
  Bachelors 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.
- **Research Contract Engineer**
  Indian Space Research Organization(ISRO) *March 2018 - May 2018*
  Contributed in laying out the foundation for deploying CCD image sensors on payloads and testing the sensor characteristics.
- **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 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)

Selected Projects

- **Clerkbot - A Butler Robot**: Built a prototype of office friendly Autonomous Fetch and Carry UGV (ROS Based) (Link)
- **SnapCut/Rotobrush**: Implemented Adobe After Effects segmentation pipeline SnapCut, a robust video object cutout using localized classifiers (Link)
- **Structure from Motion (SfM)**: A 3D reconstruction of a scene from a set of several snaps from a Quadrotor flying over a mat of AprilTags. (Link)
- **Self Balancing Robot with Complimentary filter**: A self-balancing robot based on Complimentary Filter for the IMU Sensor(MPU-6050). (Link)
- **Robust Line Follower Robot using PID algorithm with manual tuning**: A line following Robot, based on PID algorithm with online PID tuning with the help of push-buttons. **Won** 2 competitions using the robot. (Link)

Skills

Computer Languages: Python, C/C++, R, LaTeX
Operating System: Linux, Mac OSX, Windows XP/7/8/10
Softwares/Libraries: ROS, Tensorflow, Numpy, Matlplotlib, CLion, PyCharm, Jupyter, Eclipse IDE, Eagle, Matlab, RStudio

References

Yiannis Aloimonos
Professor,
University of Maryland

Dr. Dilip Kothari,
Professor,
Nirma University

Prof. Sandip Mehta,
Associate Professor,
Nirma University