Curriculum vitae – Dhaivat Bhatt

Personal Information

Dhaivat Bhatt
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Skills

Operating systems : Unix, Ubuntu 14.04.

Programming languages : C, C++, JAVA, Python, R, MATLAB, Octave

Embedded platforms : Arduino, 8086, Raspberry pi.

Softwares : LaTeX

Framework and packages : OpenCV, Robot operating system(ROS), Numpy, Scipy, Standard template library(C++), Caffe, cvx, cvxopt, pytorch, tensorflow.

Version control system : GIT/Github.

Command line : Ipython, Shell scripting.

Education

MS by research in Computer science	August 2016 - present	International institute of information technology, Hyderabad
B.E(Hons.) Electronics and Instrumentation	August 2012- May 2016	Birla Institute of technology and science, Pilani, Hyderabad campus

Area of interest

Software development, Autonomous systems, Computer vision, Optimal Control

Experience

- **MILA, UdeM :** I am currently a visiting researcher working on the project of Active localization with Prof Liam Paull at Montreal institute for learning algorithm. My task to push state of the art results in Active Localization by employing techniques from Computer vision and learnable control. *November 2018 - Present*
- **Rockwell Collins :** Led a project in collaboration with IIIT Hyderabad and Rockwell collins. The final deliverable of this project was real time moving obstacle avoidance for a fixed wing setup. Successfully tested our non-linear optimization based velocity cone solver on Bebop 2. *August 2017 - September 2018*
- **RRC, IIIT Hyderabad :** As a part of final year undergraduate thesis, I worked at RRC, IIIT Hyderabad. My task was to develop a road-curb detection algorithm for safe navigation of driverless car. *January 2016 - May 2016*
- **Srujana :** I was a winter research intern at Srujana innovation center, LV Prasad Eye institute, Hyderabad. I extensively used image processing techniques to extract important components from an image of a human eye. *December 2014 - January 2015*
- **MIT media lab, REDx Mumbai :** Worked on development of a pre-processing algorithm to remove a specular reflection from an image of the anterior chamber of the eye using blob detection algorithm. *January 2015, IIT Mumbai*
- **MIT media lab, REDx Hyderabad :** During Hyderabad edition of rethinking engineering design execution camp, I worked on a development of digital version of Cheiroscope. This device can be used to cure vision of people with binocular dysfunctionality by activating neural networks responsible for vision processing. *July 2015, ESCI Hyderabad*

Publications

Have I Reached the Intersection : A Deep Learning-Based Approach for Intersection Detection from Monocular Cameras ***IROS, September 24-28, 2017***
Long-Term Recurrent Convolutional Network(LRCN) to detect road intersection for safe navigationof autonmous car. Architecture fuses CNN and LSTM units for spatio-temporal learning.

Publication URL : https://ieeexplore.ieee.org/abstract/document/8206317/
Video URL : https://goo.gl/VUZKMM

CRF based method for robust detection of curb boundaries using semantic cues and stereo depth. ***Tenth Proceedings of ICVGIP, December 18-22, 2016***
Robust Curb Detection by fusing the outputs of deep neural-networks with dense-stereo.

Publication URL : http://dl.acm.org/citation.cfm?id=3010058
Video URL : https://goo.gl/fFTbnL

Projects

Towards Safe Navigation of Quad-copter Amongst Uncertain Dynamic Obstacles.
Thesis work, IIIT Hyderabad
A novel approach to solve stochastic optimal control problem is proposed where control has been represented as a function of overlap between two Gaussian distributions. We solve object following and obstacle avoidance problems when there is an uncertainty in the state of robot as well as obstacle/object. We demonstrate efficacy of our proposal with extensive set of simulations carried out under various constrained environmental configurations. This work has been submitted to ACC 2019.

Paper URL : https://tinyurl.com/dhaivatACC-2019
Supplementary URL : https://tinyurl.com/acc2019-supplementary
Video URL : https://tinyurl.com/acc2019-video
Presentation URL : https://tinyurl.com/acc2019-presentation

Real time dynamic obstacle avoidance using non-linear optimization based velocity cone.
August 2017 - September 2018, IIIT Hyderabad
Real time obstacle detection and avoidance routine was developed using non-linear optimization. A velocity cone was integrated with a dubins curve to make it work for non-holonomic fixed wing setup where we have radius of curvature constraints and lateral movements are not allowed.

Static obstacle presentation : https://tinyurl.com/static-rockwell
Dynamic obstacle presentation : https://tinyurl.com/dynamic-rockwell

Efficient Object Proposals. ***August 2016 - December 2016, IIIT Hyderabad***
Proposing potential objects by analyzing number of contours enclosed by a particular bounding box of consideration. we show a theoretical computational improvement over the state of the art implementation to establish object candidacy for a bounding box of interest.

Documentation URL : https://tinyurl.com/object-proposals

Aesthetic quality assessment. ***August 2016 - December 2016, IIIT Hyderabad***
Determining aesthetic quality of an image by extracting SIFT features followed by Bag of Words(BOW) representation of the image. Learning different classifiers such as Support Vector Machines(SVM) for final classification of images as good or bad.

Presentation URL : https://tinyurl.com/asthetic-quality

Real time vehicle tracking system.. ***August 2014 - December 2014, BITS Pilani***
Development of a Real-Time Public transport tracking system, a server-client setup enabling the clients to fetch location of any transport in real-time. Arduino was interfaced with GSM-GPS module to give real-time updates of the public transport vehicle.