# Nrupatunga

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## Research Interest

- My current interest and focus is on applying machine learning and deep learning for scene understanding which includes scene classification, detection, recognition and segmentation.

## Education

- **Indian Institute of Science** — Bangalore, Karnataka
  *Master of Engineering in Signal Processing* — *2010 - 2012*
  - Master Thesis: Complex Network Approach for Analysis of Biomedical signals
  - CGPA: 5.8/8.0
  - Advisor: Prof. D. Narayana Dutt
- **Sri Jayachamarajendra College of Engineering** — Mysore, Karnataka
  *Bachelor of Engineering in Electronics and Communication* — *2005 - 2009*
  - Percentage: 71.14%

## Work Experience

- **Samsung R&D India** — Bangalore
  *Technical Lead, Media Analytics and Recognition Team* — *2016-Present*

  ***Project: Semantic Segmentation of Sky and Non-sky regions in an image using Fully Convolutional Neural Network***

  * Fine tuned the weights of the pretrained VGG-16 net, for the task of sky/non-sky segmentation. Accuracy achieved on validation and test dataset >95%
  * Investigated the features learnt in each layer of the network
  * Experimentation on using sky segmentation map as prior for horizon detection
  * Languages & Tools used - Python, Caffe

  ***Project: Nearest Neighbor Image retrieval using GIST***

  * Developed code for extracting GIST descriptor for images
  * Evaluated GIST descriptor for task of Image retrieval
  * Demonstrated how GIST descriptor can be used for detection of duplicate images
  * Languages & Tools used - C++, OpenCV, MATLAB

  *Lead Engineer, AVI Solutions Team* — *2014-2016*

  ***Project: Histogram of Oriented Gradients for Pedestrian Detection***

  * Code developed for extracting HOG features, detection and for filtering detection windows
  * Trained SVM on augmented INRIA dataset
  * Demonstrated how hard negative mining and adding non maximum suppression module helps in improving the accuracy of object detection
  * Languages & Tools used - C++, OpenCV, Python, SVMLight

  ***Project: Combining Sketch and Tone for Pencil Drawing Production***

  * Code developed for color pencil sketch effect for images which mimicks human style of pencil drawing
  * Designed a GUI using QT
  * Languages & Tools used - C++, OpenCV, QT

- ***Project: Auto Image Enhancement (Galaxy S6 onwards)***
  * Developed algorithm for detection of low-light/backlight images
  * Developed algorithm for detection of poorly lit faces in an image
  * Complete architecture design of auto image enhancement engine
  * Complete JNI framework design & development for communicating between application and engine
  * Languages & Tools used - C, Matlab

*Senior Software Engineer, Multimedia Solutions Team* *2012-2014*

- ***Project: Photo Editor, Best Photo.***
  * Developed red eye correction algorithm. GUI developed using Matlab GUIDE for quick demo
  * Implemented image blur detection and ranking algorithms
  * Implemented bilinear resizer module for less memory architecture in Photo Editor
  * Optimization of Photo Editor effects using POSIX threads
  * Languages & Tools used - C, C++, Matlab
- ***Project: Touch Focus (Galaxy S5 onwards)***
  * Complete JNI framework design & development for communicating between application and engine

## Hobby Projects

1. Implementation of Canny Edge Detector. Languages & Tools used - C++, OpenCV
2. Implementation of Bilateral filter. Languages & Tools used - C++, OpenCV
3. QT based GUI Application for experimenting edge detectors such as Sobel & Canny, blurring filters such as homogeneous, median, Gaussian & bilateral Languages & Tools used - C++, OpenCV, QT
4. Image Watermarking Algorithm based on DWT DCT and SVD. Languages & Tools used - MATLAB

## Recognition

1. Awarded Galaxy S5 for the success of Touch Focus USP
2. Awarded Employee of the month - Jan 2016

## Relevant Coursework

**Signal Processing Courses:** Digital Image Processing, DSP System Design, Biomedical Signal Processing, Speech Information Processing

**Mathematical Courses:** Linear Algebra, Probability & Random Process, Detection & Estimation Theory, Mathematics for Electrical Engineers

**Deep Learning (ongoing):** Learning from Data (Abu Mostafa), Machine Learning (Andrew Ng), UFLDL (Stanford).

## Skills

**Programming Languages:** C, C++, MATLAB, Python

**Tools & Framework:** Caffe Deep Learning Framework, Microsoft Visual Studio, QT, Eclipse, Android JNI/NDK

**Work Productivity Tools:** Vim, tmux