Nrupatunga

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Research Interest

- My current interest and focus is on applying deep learning for scene understanding which includes scene classification, object 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 Research Institute India** — Bangalore
  Technical Lead, Media Analytics and Recognition Team — *2012-Present*

  Project: Deep Convolutional Network for Food Recognition
  * Trained Squeezenet model for deployment on Android phones. Accuracy: 69.5%
  * Trained Resnet-50, Resnet-101, Resnet-152 models with data augmentation and tweak to the model architecture to improve the recognition accuracy. Resnet-152 accuracy: 78.5%
  * Dataset: Food-101. Languages & Tools used - Python, Caffe

  Project: Deep Convolutional Network for Image Aesthetics
  * Trained 2-column VGG-16 model and GoogleNet model with data augmentation including data oversampling and multiple input crops. GoogleNet accuracy: 83.7%
  * Application developed to classify a given image into high and low quality
  * Dataset: AVA. Languages & Tools used - Python, PyQt, Caffe

  Project: Fully Convolutional Network for Segmentation of Sky and Non-sky regions in an image *blog*
  * Trained fully convolutional VGG-16 model. Sky segmentation map used as prior for horizon detection in an image
  * Dataset: SIFT flow. Languages & Tools used - Python, Caffe

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

  Project: Combining Sketch and Tone for Pencil Drawing Production *code*
  * Code developed for color pencil sketch effect for images which mimicks human style of pencil drawing
  * Application deveopment for Color Pencil Sketch
  * 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
- ***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 RNN and LSTM from scratch for character prediction. Languages & Tools used - Python, Numpy *code-rnn* *code-lstm*
2. Trained a SVM model for Pedestrain detection using Histogram of Oriented Gradients feature. Languages & Tools used - C++, OpenCV, Python *code*
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 *software*
4. Implementation of Canny Edge Detector, Bilateral filter. Languages & Tools used - C++, OpenCV *code*

Recognition

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

Relevant Coursework

Deep Learning: Learning from Data (Caltech), Machine Learning (Stanford), UFLDL (Stanford), Stanford CS231 course

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

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