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

- **Sri Jayachamarajendra College of Engineering** — Mysore, Karnataka
  Bachelor of Engineering in Electronics and Communication — *2005 - 2009*

Work Experience & Projects

- **Samsung Research Institute India** — Bangalore
  Technical Lead, Media Analytics and Recognition Team — *2012-Present*

  ○ *Deep Convolutional Network for Food Recognition*
    * Trained Squeezenet model for real time inference on Android devices
    * Trained Resnet-50, Resnet-101, Resnet-152 models with data augmentation and tweak to the model architecture to improve the recognition accuracy
    * Languages & Tools used - Python, Caffe

  ○ *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
    * Application developed to classify a given image into high and low quality
    * Languages & Tools used - Python, PyQt, Caffe

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

  ○ *Nearest Neighbor Image Retrieval using GIST* ⦿ *code*
    * Developed code for extracting GIST descriptor for images
    * Demonstrated how GIST descriptor can be used for detection of duplicate images in Gallery
    * Languages & Tools used - C++, OpenCV, MATLAB

  ○ *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

⭘ *One Touch 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

⭘ *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

⭘ *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*

Recognition

1. Awarded Employee of the month - Jan 2016

2. Awarded Galaxy S5 for the effort in success of Touch Focus USP

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