

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 R&D 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 and Inception-v3, Inception-ResNet-v2 models with data augmentation and tweak to the model architecture to improve the recognition accuracy
- * Data collection and expansion of models to support Indian Food Categories
- * State of the art results in Food-Recognition when compared with previously reported results
- * Paper submission for ICIP-2017 in progress
- * Languages & Tools used - Python, Caffe, Tensorflow

○ *Deep Convolutional Network for Image Aesthetics*

- * Trained 2-column VGG-16 model and GoogleNet model with data augmentation that includes 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 development 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

Learning 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 Pedestrian 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](#)

Honors & Awards

1. Awarded Employee of the month - Jan 2016
2. Recognition for contribution to Touch Focus USP solution in Galaxy S5

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, Tensorflow (Novice), Microsoft Visual Studio, QT, Eclipse, Android JNI/NDK

Work Productivity Tools: Vim, tmux