

Nrupatunga

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Research Interests: Deep Learning for Scene and Object Understanding

EDUCATION

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- **Indian Institute of Science** Bangalore, India
Masters in Signal Processing; CGPA: 5.8/8.0 2010 - 2012
 - **Sri Jayachamarajendra College of Engineering** Mysore, India
Bachelor of Engineering in Electronics and Communication 2005 - 2009

SKILLS SUMMARY

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- **Languages:** Python, C, C++, Matlab
 - **Deep Learning Frameworks:** Caffe, MXNet, PyTorch, Tensorflow
 - **Tools:** Vim, Git, Tmux, Microsoft Visual Studio, QT, Eclipse, Android JNI/NDK

EXPERIENCE

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- **Whodat™** Bangalore, India
Deep Learning Research Engineer April 2017 - Current
 - **Face Recognition for KYC automation:** Deep learning based system to verify the user's selfie with the photo in the KYC document and also to identify duplicates (if any) in the database to avoid fraud
 - Finetuned ResNet-100 single network & ResNet-100 sibling network with weight sharing. Both using additive angular marginal inter loss combined with intra-marginal loss
 - Implementation of other loss functions - Fixed & Dynamic AdaCos, Dynamic Weight Imprinting (DWI)
 - Achieved: **TAR 94.32% @ FAR 1e-5, TAR 89.95% @ FAR 1e-6** with 4-fold cross validation
 - Languages & Tools used - Python, MXNet, Tensorboard, Visdom
 - **Egocentric Camera Height Estimation in Indoors:** Deep learning based system trained on synthetic dataset to estimate the height at which camera is held to calculate the real-world scale
 - Languages & Tools used - Python, Caffe, Visdom
 - **Ground/Wall plane and centroid estimation:** Deep learning based monocular depth, normal and segmentation to estimate the planes, their orientation and the centroid for placing the virtual objects in the real-world scenes
 - Theano to Tensorflow code conversion to achieve speed for both training and inference
 - Flask app to integrate with SLAM and also multiprocessing queuing system to handle multiple models.
 - **Samsung R&D Institute** Bangalore, India
Technical Lead July 2012 - March 2017
 - **Deep Convolutional Network for Food Recognition:**
 - Squeezenet model (accuracy=69%) ported on to mobile. ResNet, Inception models for better accuracy
 - Data collection, labelling and models to support Indian Food Categories
 - Languages & Tools used - Python, Caffe, Tensorflow
 - **Fully Convolutional Network for Segmentation of Sky and Non-sky regions:**
 - Fully convolutional VGG-16 model using SIFT flow dataset
 - Sky segmentation map used as prior for horizon detection in an image
 - Languages & Tools used - Python, Caffe
 - **Detection of Duplicate images in Gallery:** Nearest Neighbor Image Retrieval using GIST descriptor ([Code](#))
 - Languages & Tools used - C++, OpenCV, Matlab
 - **One Touch Auto Image Enhancement (Commercialized in flagships after Galaxy S6):**
 - Algorithm for detection of low-light/backlight, poorly lit face images
 - Architecture design of auto image enhancement engine
 - Languages & Tools used - C, Matlab
 - **Photo Editor/Best Photo (Commercialized in all android Phones):**
 - Red eye correction, Blur Detection and Ranking Algorithm
 - Bilinear resizer module for less memory architecture in Photo Editor
 - Languages & Tools used - C, C++ Matlab
 - **Touch Focus (Commercialized in flagships after Galaxy S5):** Complete JNI framework design & development for communicating between application and engine

PERSONAL PROJECTS

- **GOTURN single object tracking (Code)**: Python + Caffe based implementation to facilitate easy training and experimentation
- **Combining Sketch and Tone for Pencil Drawing Production (Code)**: Color pencil sketch effect for images which mimicks human style of pencil drawing. Languages & Tools used - C++, OpenCV, QT
- **Pedestrian detection using Histogram of Oriented Gradients (Code)**: SVM model to detect pedestrians in the image. Languages & Tools used - C++, Python, OpenCV
- **Image Processing Toolbox (App)**: QT based GUI application to test basic blur and edge detection algorithms. Languages & Tools used - C++, QT, OpenCV

HONORS AND AWARDS

- Awarded Employee of the month - Jan 2016
- Awarded Galaxy S5 for the effort in success of Touch Focus USP

REFERENCES

- Upon Request