Prathamesh Mandke

+1(540) 252 9660 • pkmandke@vt.edu • pkmandke.github.io
in pkmandke • Blacksburg, VA

Education

Virginia Tech **Blacksburg, VA**
Master's in Computer Engineering, GPA: 4.0/4.0 *Aug'19 – May'21*
Coursework: Deep Learning, Adv Parallel Computing (on-going), Information Storage & Retrieval

Govt. College of Engineering, Pune (COEP) **Pune, India**
B.Tech Electronics & Telecommunication, GPA: 9.11/10, Class Rank: 6/81 *Aug'15 – May'19*
Minor in Computer Engineering

- Data Structures
- Object Oriented Programming
- Information Theory & Coding
- Soft Computing
- Embedded Software & RTOS
- Speech Processing

Experience

Flytbase, Inc. **Pune, India**
HackerSpace Intern - Deep Learning *Jun'19 – Jul'19*
- Worked on 1D (EAN-13 & UPC) barcode localization in warehouse automation using drones.
- Built a dataset with data augmentation and trained deep neural networks to detect multi-size barcodes.
- Trained Yolo, Faster RCNN and SSD models with Inception, ResNet and MobileNet backbones.
- Explored embedded deployment of models on the Intel Neural Compute Stick using docker in linux.
- Skills/Tools: Python - Tensorflow, C - darknet, Docker, ROS.

Siemens, Ltd. **Mumbai, India**
Siemens Student Progam Intern *Jun'17 – Jul'18*
- Domain: Industrial Autonomous Systems
- Re-vamped design, power circuit & completed programming of the S7-1200 PLC for 3TS, 3TF and 3TH contactor testing automaton to achieve cycle time reduction.
- Keywords: Ladder coding, PLCs, stepper motors, transducers, auto-transformers & DMM interfacing.

Projects

Deep Knowledge Transfer: CNN Model Compression for OpenCL-FPGA deployment **Dec'18 - May'19**
- Explored knowledge distillation in the regression based FaceNet CNN for model compression.
- MobileNet architectures (75-85% smaller than pre-trained Inception based models), used as student networks in the distillation pipeline. ~1M VGG2 cropped face images used for knowledge transfer training.
- Student networks achieve 80-83% LFW accuracy when trained with MSE in a siamese-like student teacher setting.
- OpenCL Kernels for each layer type in the teacher (Inception) and student (MobileNet) models deployed on Intel's DE10 Nano FPGA SoC for CNN inference.
- Skills: Python, Tensorflow, OpenCV, OpenCL. Details: [github].

Clustering Large Scale Text Corpora for Efficient Information Retrieval **Aug'19 - Dec'19**
- Vectorized 2 large text corpora with 33k and 1M documents using Doc2Vec - a neural network based algorithm.
- Implemented K-Means clustering, Agglomerative clustering, DBSCAN and Birch using the document vectors.
- Benchmarked using the Calinski-Harasbasz Index, the Davies-Bouldin and the Silhoutte Score.
- Skills/Tools: Python - sklearn, gensim, nltk, Docker, Kubernetes. Code: [github].

Lempel-Ziv-Welch Text File Compression - A python package **Apr'18 - Sep'18**
- A UTF-8 file compression package with average compression ratio (C.R.) of 0.5 and O(logn) phrase look-up complexity using the Trie data structure. Link to repository: [github]
- Studied C.R. as a function of file probability distribution by generating and compressing synthetic files with Exponential, Poisson, Uniform and Gaussian distributions.

Publications

- H. Kale, **P. Mandke**, H. Mahajan, V. Deshpande,"Human Posture Recognition using Artificial Neural Networks", 2018 IEEE 8th International Advance Computing Conference, Greater Noida, India, 2018, pp. 272-278. [IEEExplore]

Skills

Primary: C, Python, PyTorch, Tensorflow, Numpy, Git, Linux, Docker.
Secondary: C++, ROS, MATLAB, LaTeX, Verilog, HTML-CSS.

Awards & Honors

- Awarded the **Narotam Sekhsaria Scholarship** for graduate studies.
- Gold Medalist Soft Computing MOOC by IIT-Kharagpur (NPTEL). Certificate: [drive].