Prathamesh Mandke

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in pkmandke • Blacksburg, VA

Education

Virginia Tech   **Blacksburg, VA**
Master's in Computer Engineering (Software & Machine Intelligence)   *August 2019 – May 2021*
Coursework: CS 6524: Deep Learning, CS 5604: Information Storage & Retrieval

Govt. College of Engineering, Pune (COEP)   **Pune, India**
B.Tech Electronics & Telecommunication (GPA: 9.11/10, Class Rank: 6/81)   *August 2015 – May 2019*
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   *June 2019 – July 2019*
- 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.

Siemens, Ltd.   **Mumbai, India**
Siemens Student Progam Intern   *June 2017 – July 2018*
- 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: here.

Human Posture Recognition using Artificial Neural Networks   **Feb 2018 - May 2018**
- A system to classify human postures on a Raspberry-Pi using an Artificial Neural Network.
- Designed & built PCB node to interface ESP8266 w/ MPU-6050 IMU sensor to transmit data to a Raspberry-pi.
- Used 2 sensor nodes(thigh and chest) to collect 44,800 samples and train & deploy the neural network model using pure numpy. Accuracy: 97.5%. Code: https://bit.ly/2Ovel6a
- Skills/Tools: Python, C++, Raspberry-Pi, ESP8266. Dataset: here.

Lempel-Ziv-Welch Text File Compression - A python package   **April 2018 - Sept 2018**
- 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: https://bit.ly/2vhGPHy
- 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. Access: https://ieeexplore.ieee.org/document/8692143

Skills

Proficient: C, Python, Git, Tensorflow, Numpy.
Secondary: C++, ROS, PyTorch, 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: here.