Nikunj Lad

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EDUCATION

NORTHEASTERN UNIVERSITY   Expected August 2020
MS in Information Systems, Concentration: Machine Learning & Pattern Recognition, **GPA: 3.8/4.0**
Coursework: *Machine Learning, Big-Data Intelligence & Analytics, Data Structures & Algorithms, Parallel Computing*

K. J. SOMAIYA COLLEGE OF ENGINEERING   Jun 2012 - May 2016
BE in Electronics and Telecommunications Engineering, Concentration: Image Processing

SKILLS

Languages: Python, NumPy, MATLAB, C++, BASH, Markdown
Frameworks & APIs: OpenCV, Scikit-Image, PyTorch, Keras, Tensorflow, Pandas, Plotly, Scikit-Learn, XGBoost, CatBoost, Discovery HPC, NLTK, AutoML, H2O, Captum
SDLC | VCS | Cloud: Agile, Waterfall, Iterative, Git (Bitbucket, GitHub), CircleCI, Docker, Amazon AWS, Terraform
Algorithms: Image Classification, Object Detection, Image Segmentation, Image Registration, Camera Calibration and 3D reconstruction, Computational Photography, Pose Estimation, Super Resolution

EXPERIENCE

UII AMERICA INC. | Computer Vision Research Intern   Sep 2019 – Jan 2020
- Improved multi-threaded real-time inference pipeline by **50%** on Nvidia P5000 GPU enabled Docker using DensePose correspondence estimation and accomplished a stream rate of **20 to 21 FPS**
- Worked on skeletal tracking in human body by utilizing Astra Pro Depth camera and annotated RGBD images in C++ for obtaining end-to-end mesh recovery of human body on NVidia RTX 2080 GPU

NORTHEASTERN UNIVERSITY | Graduate Teaching & Research Assistant   Jan 2019 – Apr 2020
- Graded assignments, constructed Hackerrank quizzes and helped students with Machine Learning and Python queries
- Conducted Python and Deep Learning workshops for a batch of **100 - 150** students and mentored them
- Developed auto-modeling solutions using H2O for analyzing any data provided into the system
- Co-founded an AI research club named AI Skunkworks at Northeastern University while organizing seminars, workshops and journal clubs for students.

INVIDEO | Software Engineer   Sep 2017 – May 2018
- Scaled up video production rate for clients from **30 videos/day** to **300 videos/day** using Python and OpenCV
- Improved software efficiency by **10%** while reducing video rendering time by **10 mins/video** by incorporating face detection using Convolutional Neural Networks for automated text positioning using AWS EC2 R3X-Large instances
- Parsed new articles for understanding language semantics using Spacy and NLTK for text-to-video translation

PROJECTS

INTERPRETABILITY IN IMAGE SEGMENTATION TECHNIQUES *(PyTorch, Python, OpenCV)*
- Worked on demystifying black-box Segmentation algorithms using Grad-CAM and Grad-CAM++
- Hypothesized that interpreting Semantic and Instance segmentation feature maps is possible via inverse correlation by applying gradient visualization on classification models with same backbone architecture

GENDER AND AGE PREDICTION FROM FACE IMAGES *(PyTorch, Python, OpenCV)*
- Developed multi-threaded pipeline for real-time webcam stream based Age and Gender inference using OpenCV
- Trained custom models with Local Response Normalization using Parallel Computing on Google Cloud Tesla T4 GPU's

AMERICAN SIGN LANGUAGE (ASL) DETECTION *(OpenCV, PyTorch, Python)*
- Extracted features using Sobel, Gabor and Watershed filters and classified images using VGG-16 and VGG-19 models
- Observed multi-GPU performance of model training on Discovery High-Performance Computing platform

TEXT-TO-IMAGE METAMORPHOSIS USING ATTNGANS *(PyTorch, Python, NumPy)*
- Utilized Bidirectional LSTM based attention model for attending important language semantics from a text description
- Implemented Conditional GAN architecture with Kullback-Leibler divergence loss to generate specific bird images

MOUSE BRAIN MRI IMAGE CLASSIFICATION WITH DATA PARALLELISM *(Keras, Python, OpenCV)*
- Performed distributed data acquisition and auto stitched images to obtain high resolution training dataset
- Built ResNet-50, Inception-ResNet and ResNeXt-50 models with Data parallelism for classifying 3D MRI brain views

LEAF IDENTIFICATION USING HARLICK TEXTURE ANALYSIS *(Tensorflow, Python, NumPy, OpenCV)*
- Applied Gray-Level Co-occurrence (GLCM) based Harlick Texture Analysis for extracting leaf texture characteristics
- Used GoogleNet and Inception modules for classification on Amazon EC2 instances with auto-scaling

PUBLICATIONS

Nikunj R. Lad, J. H. Nirmal, Kshipra D. Naikare. **Total variability factor analysis for dysphonia detection**. *International Journal of Information Technology - Springer*. 2019, Vol. 11, Issue 1, pp 67–74 *(Won Best Paper Award)*