# Nikunj Lad

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I am a Computer Vision Developer and Machine Learning engineer with 2 years of experience working with Object Oriented Python, NumPy, PyTorch and developing computer vision solutions using OpenCV on High-Performance Computing Platforms.

## PUBLICATIONS

link : https://link.springer.com/article/10.1007/s41870-018-0112-5

**Nikunj R. Lad**, J. H. Nirmal, Kshipra D. Naikare. **Total Variability Factor Analysis for Dysphonia Detection**. International Journal of Information Technology - Springer. 2018, Vol. 11, Issue 1, pp 67–74 *(Won best paper award)*

## SKILLS

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|---|---|
| **Languages** | Python, NumPy, Markdown, BASH Scripting, MATLAB |
| **Frameworks & APIs** | OpenCV, PyTorch, Keras, Scikit-Learn, XGBoost, Discovery HPC, Nvidia GPUs and CUDA, SLURM |
| **Cloud frameworks** | Google Cloud, AWS (EC2, S3, RDS, CloudFormation, Code Deploy, DynamoDB, CloudWatch), Packer |
| **SDLC & Versioning** | Agile, Waterfall, Iterative, Git (Bitbucket, GitHub), CircleCI, Docker |
| **Certifications** | Machine Learning (**Stanford University**), Python Specialization (**University of Michigan Ann-Arbor**) |

## EXPERIENCE

**Northeastern University, Boston** | Graduate Teaching & Research Assistant                     *Jan 2019 – Present*
- Implemented Text-to-Image Metamorphosis using AttnGANs and trained the model on Discovery HPC using SLURM.
- Conducted Deep Learning workshops for students and managed a batch of 100+ students.

**United Imaging Intelligence, Cambridge** | Computer Vision Research Intern                     *Sept 2019 – Jan 2020*
- Implemented a multi-threaded architecture for real time inference of patients on Nvidia P5000 GPU enabled Docker using dense pose estimation, thereby achieving a real time FPS of ~20-21, a 50% increase in stream rate than before
- Worked on skeletal tracking in human body using Astra Pro Depth camera and acquired RGBD images while annotating them for obtaining end-to-end mesh recovery of human body on NVidia RTX 2080 GPU.

**InVideo – Video automation startup, Mumbai** | Computer Vision Developer                     *Sep 2017 – May 2018*
- Integrated Python scripts with OpenCV and scaled up video production rate for clients from 30 videos/day to 300 videos/day
- Improved software efficiency by 10% while reducing video rendering time by 10 min/video by implementing face detection using Convolutional Neural Networks for automated text positionings using AWS EC2 R3X-Large instances

**K. J. Somaiya College of Engineering, Mumbai** | Research Assistant                     *Apr 2017 – Aug 2017*
- Implemented a feature extraction method named I-Vectors for better classification of speech disorder signals in MATLAB and improved classification accuracy of algorithm by 6%
- Developed a Gaussian Mixture Model (GMM) based Universal Background Model (UBM) for speaker identification and voice analysis thereby yielding 98% accuracy with proposed technique

## PROJECTS

**Brain Mapping of Mouse Brain | Broad Institute Challenge** (Keras, Python3, OpenCV)                     *Jul 2019 – Sept 2019*
- Performed distributed data acquisition by auto stitiching images to obtain training dataset
- Developed an algorithm for classifying sagittal, coronal and horizontal views of mouse brain images using ResNet-50, Inception-ResNet and ResNeXt-50 Convolutional Neural Networks and trained the system in parallel using 2 Tesla T4 GPUs

**Leaf Identification using Texture Analysis** (Python3, Keras)                     *Jan 2019 – May 2019*
- Implemented Inception-v1, Inception-v3 and Inception-v4  architectures in PyTorch to identify leaf species to create a leaf search engine using Gray-Level Co-occurrence matrices (GLCM) based Haralick Texture Analysis
- Designed a modularized neural network architecture while achieving an accuracy of 85% on cross validation data and evaluated the model using log-loss, AUC, ROC, Confusion Matrix, Precision, Recall and Cross Entropy scores

**American Sign Language (ASL) Detection System** (OpenCV, PyTorch, Python3)                     *Sep 2018 – Dec 2018*
- Acquired ASL dataset consisting of 78000 sign images and preprocessed the data using data augmentation techniques like translation, rotation and scaling. Applied LeNet5, VGG16 and AlexNet architectures for classification.
- Applied Sobel, Gabor and Watershed filtering algorithms to detect texture, edges and segment the images while achieving 98% accuracy on test data with ROC of 0.98

## EDUCATION

**Northeastern University | College of Engineering, Boston, MA**                     *Expected August 2020*
Master of Science in Information Systems, GPA: 3.68 / 4.0
*Coursework: Machine Learning, Big-Data Intelligence & Analytics, Data Structures & Algorithms, Parallel Computing*