

# NIKUNJ LAD

<https://nikunjlad.dev> | nikunjrlad@gmail.com | 857-999-6620

I am a Computer Vision Developer and Machine Learning engineer with 3 years of experience developing solutions using Python, NumPy, PyTorch, and OpenCV. Recently, I started working on High-Performance Computing Platforms while exploring GPU based Data Parallelism Strategies and Image Segmentation techniques.

## PUBLICATIONS

**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

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

## EXPERIENCE

**Northeastern University, Boston** | Graduate Teaching & Research Assistant *Jan 2019 – Present*

- Researched on Text-to-Image Metamorphosis using AttnGANs and trained the model on Discovery HPC
- 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*

- Recommended a multi-threaded pipeline for real-time inference of patients on Nvidia P5000 GPU enabled Docker using dense pose estimation, thereby accomplishing a real-time FPS of ~20-21, a 50% increase in stream rate than before
- Worked on skeletal tracking in human body by utilizing an Astra Pro Depth camera and acquired RGBD images while annotating images for obtaining end-to-end mesh recovery of human body on NVidia RTX 2080 GPU

**InVideo – Video automation startup, Mumbai** | Software Engineer *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 incorporating face detection using Convolutional Neural Networks for automated text positioning using AWS EC2 R3X-Large instances

**K. J. Somaiya College of Engineering, Mumbai** | Research Assistant *Apr 2017 – Aug 2017*

- Proposed a feature extraction method named I-Vectors for better classification of speech disorder signals in MATLAB and improved classification accuracy of algorithm by 6%
- Formulated 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 stitching 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 them in parallel on 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 by making use of Gray-Level Co-occurrence matrices (GLCM) based Haralick Texture Analysis
- Designed a modularized neural network architecture while gaining an accuracy of 85% on cross-validation data and evaluated the model by observing 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 data by employing data augmentation techniques such as translation, rotation, and scaling. Applied LeNet5, VGG16, and AlexNet architectures for classification
- Applied Sobel, Gabor and Watershed filtering algorithms to detect textures, edges, and segment those images while attaining 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: 3.77 / 4.0**

Coursework: Machine Learning, Big-Data Intelligence & Analytics, Data Structures & Algorithms, Parallel Computing