

# Suyog Jadhav

B.Tech. (Third year), Indian Institute of Technology, Dhanbad, India  
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Looking for opportunities in the application of deep learning in the field of biomedical imaging and healthcare. I have previous work experience in dealing with MRI scans and developing CAD systems for diagnosing various ailments from medical images. Experienced in chief machine learning libraries including PyTorch, TensorFlow, Keras, OpenCV, dlib, Numpy, Pandas, Matplotlib, Scikit-learn etc. and Flask. Can code fluently in Python (2/3), C++, C, and MATLAB/GNU Octave. I also have a bit of background in Natural Language and Signal Processing.

## Past Work Experience

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### Deep Learning R&D Intern, [Cancer Moonshot](#)

Jun. - Jul.

2019

Developed a deep learning model for the detection and segmentation of prostate cancer lesions from prostate MRI scans. Specifically, modified the U-Net architecture to achieve substantially good results even on less amount of data, a prevailing problem in the medical imaging sector..

### Python Developer Intern, [DataProrisi Inc](#)

Dec. 2018 - Jan. 2019

Developed the backend in Flask for DataProrisi, a startup focused on revolutionizing the loan acquisition process using machine learning, based in California.

### AI Team Head, [Cyber Labs](#)

Dec. 2017 -

Present

Head of the AI team of Cyber Labs, the official cyber society of IIT (ISM), Dhanbad. Cyber Labs is the initiative of IIT (ISM) students in the footsteps of MIT Media Labs, MIT. Our team focuses on working on various projects that use ML, DL or in general, any field of AI.

## Projects

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### ⊖ Accurate Pedometer Algorithm for Cardiac Rehabilitation Patients

Aug 2019 -

Ongoing

**Working on this research project under Dr. Shehroz Khan, University of Toronto.** Cardiac rehabilitation patients are required to perform a walking exercise as part of their rehabilitation, the performance in which is used to prescribe them the next dose of medications. A 2017 [study](#) highlighted the inadequacy of traditional step-counting algorithm (based on thresholding and peak detection) employed by pedometers in the case of these patients, with error rates in going as high as 30% in some cases. A 30% error rate is not acceptable in the field of medicine. We are trying to develop a better algorithm using LSTMs that is robust to these variations and works equally well for any user.

### ✓ [ChestX](#)

Sep. 2019 -

Ongoing

Developed a computer-aided diagnosis system for classifying chest X-ray scans into 14 different classes. Used a novel 3-stage deep learning architecture and achieved a maximum AUC score of 0.91 (on Emphysema) with the average AUC score being 0.84. In addition to classifying the images, the system also calculates and displays the class activation maps for each of the classes, aiding in highlighting the key regions in the given X-ray scan to help radiologists. **Secured 2nd rank in CDAC AI hackathon 2019 co-sponsored by Nvidia.**

### ✓ [3D MRI Brain Tumor Segmentation using autoencoder regularization](#)

Apr.

2019

Implemented the Brats-2018 winning [paper](#) by the same name (author: Myronenko A.) in keras. Implemented the custom loss function used, the variational decoder branch and the vanilla autoencoder part all from scratch. **The project has 80+ stars on Github and is featured on paperswithcode.com.**

### ✓ [Brainy](#)

Jan. 2019

Along with 2 fellow members of the team, designed a web portal that can be used by doctors to get the brain MRI scans analyzed simply by uploading the scans using their login ID. We modified the U-Net model and trained it to segment out the brain tumors from the MRI scans of the brain. **Achieved 4<sup>th</sup> rank out of 22 finalist teams in the PanIIT AI Hackathon 2019 and got featured on paperswithcode.com.**

### ✓ DriveSmart (A startup funded by CIIE, IIT Dhanbad)

Sep.

2018

Developed a smart system for cars that alerts the driver with visual cues and audio alerts when the driver gets distracted from the road or is drowsy. Used OpenCV, and dlib to create a multithreaded real-time object detector

that could achieve **object detection speeds of more than 60 FPS**. Further, we designed and trained a head pose estimation model in TensorFlow. Only the multithreaded object detector is open-sourced ([here](#)) due to NDA.

## ✓ [FaceSearch](#)

Jul.

2018  
Created a command-line tool that takes an image, detects faces in it, lets the user select one and then tries to establish the identity of the person by performing Google reverse Image search on the face. Used OpenCV. Implemented in Python. The **project got 25 stars on the GitHub repository** in a short time after its release.

➤ The complete list of projects can be found on [my Github profile](#).

## Skills

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- **Languages:** Python 3 | Python 2 | C++ | C | Matlab | GNU Octave | Javascript | CSS
- **Tools & Libraries:** PyTorch | Keras | TensorFlow | OpenCV | dlib | SimpleITK | Numpy | Git | Linux | Scipy stack | Pandas | Matplotlib | Scikit-learn | Regex | XGBoost | Flask | Docker | GCP | Fastai
- **Development:** Machine Learning | Deep Learning | 2D and 3D Convolutional Neural Networks | Recurrent Neural Networks | Generative Networks | Fine-tuning pre-trained models | Computer Vision | Competitive Data Science | Audio Processing | Image/Video Processing | API & Backend Development

## Certifications

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- **Advanced Machine Learning Specialization** *by HSE - National Research University on Coursera*
  - [Introduction to Deep Learning \(with Honors\)](#)
  - [How to Win a Data Science Competition: Learn from Top Kagglers \(with Honors\)](#)
- **[Deep Learning Specialization \(5/5 Courses\)](#)** *by deeplearning.ai on Coursera*
- **[Machine Learning](#)** *by Stanford University on Coursera*

## Recent Achievements

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- **2<sup>nd</sup> rank @ CDAC AI Hackathon 2019** co-sponsored by Nvidia *Sept. 2019*  
**Secured 2<sup>nd</sup> rank** in the finals out of top 12 teams qualified for the final stage. We designed a diagnosis system for chest X-ray scans with 0.84 average AUC (*already described in the projects section*). We also made our system production-ready by utilizing inference on the edge and deployed it on Jetson Nano using TensorRT, causing 20x speedup in inference.  
Team Members: Udbhav Bamba, Gk Tejus, Deepanshu Pandey
- **4<sup>th</sup> Rank @ PanIIT Mission AI: Solve For India Hackathon** *Jan. 2019*  
**Secured 4<sup>th</sup> rank** in the final round out of 22 teams selected for the final round. We trained a model to segment brain tumors from 3D MRI data. We were able to achieve a weighted dice loss of around  $\sim 0.43$  on the validation set. The model was then served through a web app, designed by me using Flask. Previously, we had achieved 11<sup>th</sup> rank overall out of more than 300 teams in the qualifying round to qualify for the final round. The final round of the Mission AI: Solve for India hackathon organized by PanIIT, was held at IIT Delhi from 19<sup>th</sup> to 20<sup>th</sup> January 2019.  
Team Members: Udbhav Bamba, Gk Tejus
- **Recipient: PyTorch scholarship Udacity - Facebook** *Oct. 2018*  
Got selected for the PyTorch scholarship challenge by Facebook AI and Udacity, to pursue an in-depth course on PyTorch by Facebook AI on Udacity