Aditya Shrivastava

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EDUCATION

INSTITUTE OF TECHNOLOGY, NIRMA UNIVERSITY

BTech in Information Technology | Class of 2021
Ahmedabad, IN

LINKS

Github:// **imadtyx**
LinkedIn:// **Aditya Shrivastava**
Twitter:// **@iamadtyx**
Pinterest:// **adityashrivastava27**

COURSEWORK

UNDERGRADUATE

Operating Systems
Database Management Systems
Object Oriented Programming
Machine Learning
Theory of Computation

SKILLS

PROGRAMMING

Over 5000 lines:
Python • C & C++
Over 1000 lines:
Java • HTML & CSS • Shell
Over 500 lines:
SQL • Javascript • SciLab • MatLab
Familiar:
Git • Ruby • LaTeX

TOOLS & SOFTWARES

Visual Studio • Sublime • Github
VirtualBox • VMware • SQLPlus
Sublime/PyCharm • Anaconda
CodeBlocks/Notepad++ • Overleaf
Apache Hadoop • Apache Spark

FRAMEWORKS

Numpy • Scipy • Pandas • Scikit-Learn
• MatplotLib • Tensorflow 2.0 • Keras
• PyTorch • PySpark

EXPERIENCE

INDIAN INSTITUTE OF TECHNOLOGY, GANDHINAGAR

RESEARCH INTERN
Dec 2019 – Present | Gandhinagar, IN

- Working with Prof. Krishna Prasad Miyapuram to investigate the training algorithms for Capsule Networks viz. Dynamic Routing and Expectation Maximization and improve their performance in medical image classification task.
- Further extending the baseline architecture by cross-calibration of multiple Capsule Networks for multilevel classification and segmentation tasks.

INDIAN INSTITUTE OF MANAGEMENT, AHMEDABAD

RESEARCH INTERN
August 2019 – November 2019 | Ahmedabad, IN

- I worked with Prof. Manish Aggarwal to extend the design of currently used intractable loss functions in neural networks.
- Incorporated explicit adaptability and flexibility parameters to make it more robust to outliers, achieve higher convergence rate and the state-of-the-art performance in comparatively less data.

RESEARCH

ITNU ISRO PROJECT LAB | UNDERGRAD RESEARCH ASSISTANT

July 2019 – Dec 2019 | Ahmedabad, IN

- Worked with **Prof. Jai Prakash Verma** and **Prof. Sanjay Garg** on their project **"Design and Development of a Scalable Framework for Geospatial/ Geoscience Data Ingestion, Ad-hoc Queries and Analysis in Big Data Environment"** externally funded by Indian Space Research Organization (ISRO).
- Developed a novel scalable framework as a hybrid of two machine learning algorithms for long-term trajectory prediction and optimized the framework to predict trajectories in realtime.
- The framework had Big Data Analytics environment on the back end to enable fast query processing that was integrated with Deep Learning based sequence prediction engine on the front end for accurately predicting long term trajectories.

PUBLICATIONS

- Aditya Shrivastava, Jai Prakash Verma, Swati Jain, Madhuri Bhavsar, and Sang Won Yoon. Leveraging capsule network architecture in diagnosing breast cancer histopathology levels. *Expert Systems with Applications*, Forthcoming 2020.
- Aditya Shrivastava, Jai Prakash Verma, Swati Jain, and Sanjay Garg. Scalable deep learning approach for low latency trajectory prediction. *Engineering Applications of Artificial Intelligence*, Forthcoming 2020.
- Aditya Shrivastava and Manish Aggarwal. AdMa: A flexible loss function for training deep neural networks. *IEEE Transactions on Neural Networks and Learning Systems*, Forthcoming 2020.

CERTIFICATIONS

Tensorflow in Practice,
Coursera
Deep Learning for Coders,
Fast.ai
Machine Learning Microcourse,
Kaggle
Applied Data Science with Python,
Coursera

HOBBIES

Playing guitar.
Reading good books.
Watching classic movies.
Boxing and work-out.

INVITED TALKS

WORKSHOP ON IMAGE PROCESSING USING DEEP LEARNING
Guest Speaker | Pandit Deendayal Petroleum University (PDPU)
November 2019

- Was invited by Silver Touch Technologies Ltd. to lecture the bachelor students of PDPU for their 3 day Capsule Program.
- As a part of the program, I had lectured an audience of more than 80 students on topics: Image Classification using Convolutional Neural Networks (CNNs), Multi-label Classification, CNN Regression, Image Segmentation using U-Net architecture and Capsule Networks.

SUMMER SCIENCE PROGRAMME
Instructor | Gujarat Science City
June 2019

- Was invited by Gujarat Council of Science and Technology (GUJCOST) to deliver two lecture series at Gujarat Science City.
- The first series was on C++ Programming Language and the second series was on Computer Game Making Tools.
- Both the topics were taught in-depth along with full hands-on experience to an audience ranging from 12 to 22 years of age .

PERSONAL PROJECTS

APPLIED MACHINE LEARNING IN CERN EXPERIMENTS
August 2019 - October 2019

Did a collective of following mini-projects to infer from the data generated at CERN using Machine Learning: Measured exact mass of Z-boson. • Identified the type of subatomic particle. • Identified evidence of rare decay. • Searched for possibility of dark matter particle candidates. • Devised simple tracking system similar to that of Atlas.

BUILT GENERATIVE ADVERSERIAL NETWORKS (GANS)
January 2019 - April 2019

Many types of GANs were studied viz. DCGAN and Wasserstein GAN. A vanilla GAN model was trained on CelebA dataset where it produced realistic faces. Later, the model was also trained on leaf dataset obtained from Kaggle where it also produced real looking images of leaves.

IMAGE SEGMENTATION
June 2019 - July 2019

Image segmentation was performed using U-net architecture on the ADK20K dataset made publicly available by MIT-CSAIL. Transfer-Learning U-net architectures were deployed, namely- ResNet-50, ResNet-34, VGG-19 and DenseNet 121. Highest accuracy was 71.21% (best so far is 74.32%).

TRANSFER LEARNING ON CUSTOM DATASET
December 2018

Generated my own image dataset of three skyscrapers of New York namely- Chrysler, Empire State Building and One World Trade Center using webscraping. Later used various transfer learning models like ResNet-50, ResNet34, ResNet18, VGG-19, Inception etc. on the dataset. Even though the dataset had many outliers, highest accuracy of around 91% was achieved.