Shivam Chaudhary

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EDUCATION

INDIAN INSTITUTE OF TECHNOLOGY, MANDI   H.P., India
B.Tech in Mechanical Engineering (CG: 6.1) w/ minor in Intelligent Systems   Aug 2016 - July 2020
Coursework: Deep Learning and its Application, Pattern Recognition, Computer Vision, Data Structures and Algorithms

EXPERIENCE

GMO RESEARCH   Shibuya, Japan
Machine Learning Engineer Intern   Jan 2020 - Feb 2020
• Worked on a marketing domain dataset to determine the probability of a survey to be answered by a person within different time frames [-12H, -24H, and -48H] through benchmarking various ML Algorithms like Random Forests, Decision Trees, DNNs.
. • Challenges included highly imbalanced data and implementation of custom metrics which were effectively tackled using methods like SMOTE and Tensorflow, respectively, to successfully provide a model with an efficacy of about 91%.
• This helped the company to segregate and target the surveys towards more efficient and fast answering panels making the system more time and cost efficient. For example, people with high probability to answer a survey within 12H of its release were given more valued and calibrated surveys.

INDIAN INSTITUTE OF TECHNOLOGY, MANDI   H.P., India
Teaching Assistant in course Deep Learning and its Application (CS671)   Feb 2020 - July 2020
• Worked with Prof. Aditya Nigam, to help trainees learn various deep learning algorithms like CNN, RNN, Autoencoders, GANs, etc., via lab and doubt sessions to provide visual descriptions and intuitive understanding.
• Helped trainees in implementing backpropagation, GANs, Autoencoders from scratch using Tensorflow / Keras.

INDIAN INSTITUTE OF TECHNOLOGY, MANDI   H.P., India
Teaching Assistant in course Data Science II (IC272)   Aug 2019 - Dec 2019
• Worked with Prof. Dileep A.D., to help trainees learn various machine learning algorithms like Linear Regression, k-Means Clustering, Bayes' Classifier, Gaussian Mixture Models, Principal Component Analysis, etc.
• Helped them learn the algorithms through visualization, understanding the mathematics behind them and answering the non-trivial questions, for instance, "Why 1.5 in IQR Method of Outlier Detection? Why not any other scale?"

PROJECTS

MEMOIR   IIT Mandi
Python Library for easy implementation of Deep Learning Algorithms [documentation]   April 2020 - Present
• Python library to facilitate implementation of neural networks by reading from a JSON file, image data augmentation techniques like affine and intensity transformation and data preprocessing like feature scaling, channel alterations, etc.
• Calculates statistics for image data, like standard-deviation and mean, using Welford's Algorithm.
• Aims to incorporate advanced deep learning algortihms like Autoencoders and GANs.

GENERATIVE AND CLASSIFICATION MODEL   IIT Mandi
Educational Project to understand working of various GAN architectures
• Implemented various architectures of GANs like DCGAN, StacksGAN, CyclicGAN, pix2pixGAN, etc., to understand their working and hurdles in training them using Tensorflow on datasets like IMDB-Wiki Faces Dataset, Danbooru Face Art, CelebA Dataset, CUB Dataset, Monet2Photo Dataset, Facades Dataset etc.
• Implemented deep learning paper Face Aging with Conditional Generative Adversarial Networks to generate images of people given their age. It can be used in security applications, as current system requires the dataset to be regularly updated which could be generated otherwise using this model.

RSNA PENUMONIA DATASET   IIT Mandi
Exploratory Data Analysis on Medical Dataset [code]
• Performed exploratory data analysis on RSNA-Pneumonia dataset to draw concrete and underlying importance of various features and their role in determining the presence/absence of pneumonia.
• I found that the x-ray images for positive and negative cases of pneumonia have two peaks but they lie in different regions of their histograms which is characteristic difference and can be of significant help.
• Studied each feature and found that uncommon features like number of follow-ups a patient received, number of symptoms shown by a patient, and the position of x-ray images plays a crucial role in determining the presence/absence of pneumonia.

TENSORFLOW DENSE LAYER API   IIT Mandi
A custom built TF Graph
• Built a graph using Tensorflow with user input (hyper)parameters to implement a dense neural network and backpropagation from scratch for classification of a custom made line dataset.

ULTRASONIC DRYING OF INDUSTRIAL CARDBOARD IIT Mandi

Research Project
- Worked with **Prof. Satvasheel Powar** to study and research on various methods to dry industrial cardboards like **solar drying**, **air drying**, **hygroscopic drying**, and advanced methods like **ultrasonic drying**.
- Ultrasonic drying using **piezoelectric discs** vibrated at ultrasonic frequencies and converting the moisture into mist proved to be the **most effective and economical** amongst others.

AYUSHMAAN IIT Mandi

Medicine Vending Machine - Design Practicum Project
- Worked with an inter-disciplinary team to build a **medicine vending machine** with in-built capabilities to **measure blood pressure** and **sugar level** along with proposed and prototype features like live-chat with a doctor for consultation.
- Evaluated and appreciated by **Prof. S. R. Kale**, the machine was built with the motivation to **provide access to basic medicinal requirements** in rural areas and zones with little-to-no medicinal facilities.

SKILLS

- **Programming Languages:** Python, SQL, LaTeX, MATLAB, C++
- **Other Technologies:** TensorFlow, Tensorboard, Keras, GIT, Linux, GPU Systems like HPC, and Libraries: Numpy, Pandas, Scikit-Learn, OpenCV, Matplotlib
- **Softwares:** IDEs, SolidWorks, Adobe -Photoshop, -Lightroom

POSITION OF RESPONSIBILITIES

- **Public Relations Head** for Exodia '17, the annual cultural and technical fest of IIT Mandi.
- **Head Coordinator** of Entrepreneurship Cell, IIT Mandi (2017-2018).
- **Mentor** at Guidance and Counseling Service, IIT Mandi (2017-2020).

AWARDS AND HONORS

- **Gold Medal** at Inter IIT Annual Cultural Meet 2017 for creative and artistic compilation of photos in Art of Photoshop event.
- **1st Prize** in IIT Mandi Hackathon 2018 for building a database system to make all official work in IIT Mandi paperless.
- **1st Prize (State)** in International Science Olympiad 2013.

HOBBIES AND EXTRACURRICULAR INTERESTS

- Like to write machine learning articles and blogs on **medium**.
- Was an active member of **Literary Society**, **Photography Club**, and **Designing Club** of IIT Mandi.