

Shivam Chaudhary

Passionate problem solver who likes exploring machine learning and preparing to be a data scientist through the road less taken.

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Education

2016–2020 **Bachelor of Technology**, Department of Mechanical Engineering with minor in Intelligent Systems, Indian Institute of Technology, Mandi, India.

2013–2015 **Higher Secondary Education**, Sanskriti Devi School (CBSE), Mathura, India. 88.7%.

2001–2013 **Secondary Education**, Sacred Heart Convent School (ICSE), Mathura, India. 92.3%.

Projects

June–July 2019 **Generative and Classification Model**, Deep Learning.

- Built a model to generate images of dogs using conditional deep convolutional generative adversarial networks.
- The model was evaluated using various parameters but the most prominent was the ability to generate images which could be classified into dog breeds using a different discriminative model.
- I also tried to understand the working of different types of GANs (Pix2Pix, Cyclic, LSGAN, etc) on the same dataset, which hopefully I would be able to generalize for a broader class of datasets soon.
- *Technologies and Language used:* Tensorflow, Tensorboard and Python (Numpy and OpenCV)

Aug–October 2019 **Colorization of Grayscale Videos**, Deep Learning.

- Worked on a model to color grayscale videos.
- Implemented an auto-encoder based on U-Net architecture, which gave appreciable results.
- *Technologies and Language used:* Tensorflow, Keras and Python (Numpy and OpenCV)

May 2019 **Signature Forgery**, Deep Learning.

- Built a model to predict the coordinates of a signature at each timestamp after seeing its image.
- It was an LSTM model trained on about 600 signature images along with the values of (x, y) coordinates at corresponding timestamps.
- The model could be used to verify an online signature.

March 2019 **Tensorflow Dense Layer API**.

- Built a dense layer API from scratch with number of neurons, activation function and input shape as the attributes to be entered, and included implementation of backpropagation from scratch.
- The code was tested on MNIST Hand-written dataset and gave an accuracy of about 98%.

December 2018 **Deep Learning on Biometric Data**.

- My work under this project was to classify and localize significant part of an image in a dataset which consist of images of palm, palmar flexion creases, and finger knuckle.
- Also, I built a model to mask out the iris of an eye using Pixelwise Image Segmentation.

June–July 2018 **Ultrasonic Drying of Industrial Cardboard**, Summer Research at IIT Mandi.

- I studied how to dry a wet industrial cardboard[subject] using ultrasonic vibrations of piezoelectric transducers which turn the water into a cool mist as it is removed from the fabric.
- More economical than other modes of drying.

Feb–May 2018 **Ayushmaan - Medicine Vending Machine**, Design Practicum.

- Worked with a team to build a prototype of a medicine vending machine with the utilities to measure patients' heartbeat rate and live video call with the nearest doctor in case of emergency.

Skills

Programming Python, C++, C, SQL, MATLAB

Software VS Code, Anaconda, LaTeX, SolidWorks, Adobe -Photoshop, -Lightroom, -Illustrator

ML Tools Tensorflow, Keras, TFLearn, Scikit-learn, Numpy, OpenCV, Pandas, Matplotlib, Tensorboard

BD Tools Spark, MapReduce

Others Linux, Windows, Git, GitHub, Kaggle, Working on Parallel GPU Systems like HPC

Courses Computation for Engineers, Data Structures and Algorithms, Deep Learning and Its Applications, Pattern Recognition, Applied Database Practicum, Linear Algebra, Machine learning by Andrew Ng, Probability and Random Processes, Machine Drawing.

Work Experience

Jan 2020 – **Intern at GMO-Research, Japan, Machine Learning Engineer.**

- Feb 2020
- My project was based on marketing domain. I had to determine the probabilities for a person to answer a survey within -24 hours, -48 hours, and -120 hours from the time of entry of the survey.
 - The dataset I worked with had over 3 million data points and was highly imbalanced. The majority class (surveys which were not filled) comprised of about 90% of the whole dataset. I applied techniques like Over-sampling, Under-sampling, SMOTE, cost-sensitive learning, etc. to make the data balanced.
 - I built functional sequential models with dependent outputs, which were alternatively trained, using Tensorflow. The first model was to predict whether a person would answer a survey or not, the second model (dependent on the output of the first one) was to estimate the probabilities.
 - I also tried various machine learning models, viz., Gradient Boosting Regressor, Random Forests, Decision Trees, Support Vector Regressor, etc., using scikit-learn, whose hyperparameters were optimized using Grid-Search CV.
 - Both the solutions were successfully approved.

Aug 2019 – **IIT Mandi, Teaching Assistant in course Data Science (IC272).**

- Dec 2019
- Helped students learn various machine learning algorithms like Linear Regression, k-Means Clustering, Gaussian Mixture Models, Principal Component Analysis, etc., with intuition.
 - Assisted the course faculty in the successful conduction of the course lab (Libraries/Technologies used: Numpy, Pandas, Matplotlib, Scikit-Learn, Spyder).
- Reference: Dr. Dileep A. D. (<http://faculty.iitmandi.ac.in/~addileep/>)

Feb 2020 – **IIT Mandi, Teaching Assistant in course Deep Learning (CS671).**

- Present
- Help students learn various deep learning algorithms like Vanilla Neural Networks, Convolutional Neural Networks, Recurrent Neural Networks (LSTMs, GRUs, etc.), Autoencoders, Generative Adversarial Networks, etc., with intuition.
 - Assist the course faculty in the successful conduction of the course lab (Libraries/Technologies used: Tensorflow, Keras, Pytorch, Numpy, OpenCV, Pandas, Matplotlib, Scikit-Learn).
- Reference: Prof. Aditya Nigam (<http://faculty.iitmandi.ac.in/~aditya/>)

Positions of Responsibility

2017-2018 **Head of Public Relations | Exodia, IIT Mandi**

Maintained healthy and mutually beneficial relations between Team Exodia and sponsors, and colleges.

2017-2018 **Head Coordinator | Entrepreneurship Cell, IIT Mandi**

Helped students with their startup ideas; conducted related competitions to teach them entrepreneurial skills.

2017-Present **Mentor | Guidance and Counseling Service, IIT Mandi**

I make sure that new students do not feel any problem(s) while adjusting to new lifestyle.

Awards and Honors

Gold Medal Inter IIT Cultural Meet 2017

For creative and artistic compilation of photos in Art of Photoshop event.

1st Prize IIT Mandi Hackathon 2018

For building a database system to make all official work in IIT Mandi paperless.

1st Prize International Science Olympiad 2013

Extra-curricular Activities

- In my spare time, I like to write and play guitar.
- Member of **Literary Society**, **Photography Club**, and **Designing Club** of IIT Mandi.
- Organized several events in my college including Farewell Party, Street Soul in Exodia '17, etc.