

# Anupam Anurag Tripathi

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## EDUCATION

### Northwestern University

*Master of Science in Artificial Intelligence* | GPA: 3.93/4

*Relevant Coursework:* Advanced Computer Vision, Computational Photography, Data Science, Geospatial Vision and Visualization, Deep Learning Foundations, Statistical Pattern Recognition, Statistical Language Modelling, Design and Analysis of Algorithms.

Evanston, IL

Sept 2019 - Mar 2021

### University of Mumbai

*Bachelor of Technology in Computer Engineering* | GPA: 3.6/4

*Relevant Coursework:* Artificial Intelligence, Neural Networks, Advanced Databases, Applied Math, Big Data, Image Processing.

Mumbai, India

Aug 2015 - Jun 2019

## WORK EXPERIENCE

### Graduate Research Assistant (Data Science), Kellogg School of Management, Evanston IL

Feb 2020 - Present

- Developing an econometric model using Machine Learning techniques to find causal impact of eco-labels on demand steering.
- Analysing the delivery time slots using Probit and Mixed Logit regression to offer incentives for the customers.

### Student Researcher, Home Depot, Evanston IL

Oct 2020 - Dec 2020

- Generated strategies to mitigate inventory shrink losses by analysing misclassification of visually similar products.
- Created multi-dimensional encodings by concatenating the output vector of Convolutional Autoencoder to product weight, dimensions and Glove embedding of product description.
- Developed a search algorithm to calculate encoding of products by generating multiple metrics derived using cosine similarity.
- Enhanced precision of demand/pricing models by **10%**, and presented insights of analytical results for **2500+** products.

### Machine Learning Intern, Sin Emerging Technologies, Milwaukee WI

Jun 2020 - Sept 2020

- Determined correctness of workout postures for an AR/VR game using Pose Estimation.
- Identified important joints by implementing Key-Point Detection and treated those (x, y, z) coordinates as RGB pixels.
- Detected the workout form using size independent CNN on generated image data and deployed the model using Onnx.

### Artificial Intelligence Intern, Home Drone, Mumbai, India

Sept 2018 - Jan 2019

- Designed drones to be smarter and fully automated for applications such as outdoor projectors and intra office transport.
- Developed path detection algorithms to help drones navigate in known indoor environments in the shortest way possible.

### Machine learning Research Intern, University of Mumbai, Mumbai India

Dec 2017 - Jan 2018

- Built a pipeline that extracted live video from a webcam showing the person's Facial Expressions in real-time.
- Performed a comparative study using a Fully Connected Neural Network, a CNN trained from scratch, and a CNN trained using Transfer Learning with a winning accuracy of **95%**.

## SKILLS

**Tech Stack:** Python, Java, MATLAB, C, C++, MySQL, Oracle11g, PostgreSQL, MongoDB

**Tools and Frameworks:** AWS, Azure, PyTorch, Tensorflow, Keras, PyTorch3D, OpenCV, Kornia, CUDA, Tableau, Databricks

## PUBLICATIONS

Vision: A Deep Learning Approach to provide walking assistance to the visually impaired: Nikhil Thakurdesai, Anupam Tripathi, Dheeraj Butani, Smita Sankhe. arXiv:1911.08739, November 2019.

## PROJECTS

### Novel View Synthesis (Facebook)

Apr 2020 - Present

- Applied Multi-Plane Image representation (MPI) aiming to improve computational time for creating novel views.
- Reduced the view rendering time to **80%** by strategically placing planes using alpha density & vanishing points of the scene.
- Implemented a two-pass Deep Learning approach to generate and refine MPI for real time video view synthesis.

### 3D Anthropometric Measurement

Apr 2020 - Jun 2020

- Acquired clothing measurements of clients by using self-supervision from 360° input images with an R2 score of **0.62**.
- Deformed a pre-defined body mesh by comparing its projection to input views by training Siamese network on adversarial loss.
- Measured circumference of body parts using A\* algorithm on the trained mesh & provided final estimates with 1D embeddings.

### Analysis of Chicago Police Dataset

Sept 2019 - Dec 2019

- Derived insights on officer misconduct by analyzing the Chicago Police Dataset having **30+** tables and **6M+** rows.
- Built a co-accusal network using NetworkX and analyzed it using PageRank algorithm for profiling key officer nodes.
- Classified unstructured complaint reports into multi-label misconduct categories using NLP techniques with an F1 score of **0.72**.
- Presented findings on behavior of officers and misuse of power based on compelling visualizations in Tableau and D3.js.

### Audio Assistance for Blind

Jul 2018 - May 2019

- Developed an application that provides real time walking assistance to the visually impaired in the form of audio instructions.
- Employed YOLOV3 for Object Detection with **88%** accuracy and used monocular depth estimation to cut camera costs by **50%**.
- Secured 1st position at Hackathon organized by AWS held at Northwestern University, Evanston.

**Other Projects:** Text to SQL, Analysis on Chicago Police Dataset, Facial Emotion Recognition, Face Recognition using One Shot Learning, COVID-19 Spread Prediction using Graph Neural Networks.