

RAUNAK VIJAN

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EDUCATION

Indiana University, Bloomington, IN

August 2018 - May 2020 (Expected)

Masters Of Science in Computer Science with **CGPA 3.85/4**

Coursework: Machine Learning, Algorithms, Computer Vision, Image Processing, Cloud Computing, Operating Systems

D. J. Sanghvi College of Engineering, University of Mumbai, India

July 2014 - June 2018

Bachelor of Engineering in Computer Engineering with **CGPA 8.09/10**

Coursework: Data Structures, Object-Oriented Programming, Probability, Statistics, Calculus, Computer Networks, Databases.

TOOLS AND TECHNOLOGIES

Programming Languages: C, C++, Java, Python, Javascript, MATLAB

Web, Databases and OS: HTML, CSS, Node.js, Vue.js, jQuery, flask, AJAX, XML, MySQL, NoSQL, Unix, Windows, MacOS

Machine Learning and Cloud: Tensorflow, Keras, PyTorch, Numpy, Pandas, Sklearn, OpenCV, Matplotlib, GCP, AWS

WORK EXPERIENCE

Paper Culture, San Francisco Bay Area, California

May 2019 - Present

Artificial Intelligence Intern (Continued as Master's Thesis at Indiana University)

- **Layout Generation:** Researching on greeting cards layout generation on vector graphics data(.ai files) using state-of-the-art generative models like Generative Adversarial Networks and Variational Autoencoder as a part of my Master's Thesis at IU.
- **Font Embedding:** Learned latent space of 3000 fonts using a Variational Autoencoder with Kullback-Leibler annealing. Generated new fonts by sliding the values of the latent space and performed font similarity matching using Cosine distance.
- **Neural Style Transfer:** Implemented Neural Style Transfer with Adaptive Instance Norm on a dataset of around 80000 style and content Images. Created an app for font generation and style transfer using flask backend API and vue.js frontend.

Nimble (by GoodCarma Solutions Pvt Ltd.), Mumbai, India (<http://www.getnimble.in/>)

May 2018 - July 2018

Data Science Intern

- Developed pay-as-you-drive insurance plan by creating algorithms for driver behavior analysis on time-series telematics data.
- Devised techniques for detecting harsh acceleration, brakes and turns using mobile IMU sensors for forecasting a risk score.
- Applied Machine Learning to classify mode of transportation as walking, car, bus or train by engineering features of sensor signals and examining models like K-Nearest Neighbor, Naive Bayes, State Vector Machine, Random Forest and XGBoost.

PROJECTS

Voice Style Transfer Using Star Generative Adversarial Networks

- Implemented a style-mimicry frameworks for the synthesis of impersonated voices with Non-Parallel data using StarGAN.
- Trained the model to perform any-to-any style transfer on VCTK dataset consisting of 10 speakers having different accents.

Road Scene Segmentation

- Implemented a U-Net based model for road segmentation comparing Weighted Cross Entropy and Soft Dice Loss function.
- Improved performance using Bayesian SegNet and Markov Random Field Smoothing achieving IoU of 0.62 on Camvid data.

Image Panorama Generation

- Applied RANSAC to find relative Affine Transformation between images utilizing Scale-Invariant Feature Transform features.
- Performed Image Registration and blended images together by averaging pixels in the new common coordinate space.

Speech Denoising using Neural Networks

- Utilized a supervised approach for denoising of speech signals comparing 1D and 2D CNN and RNN with LSTMs and GRUs
- Achieved a signal-to-noise ratio of 13 using RNN with Long short-term memory thus producing a high quality audio output.

Speaker Verification using Siamese Networks

- Trained a Siamese Network to perform speaker verification on speech signals on a dataset consisting of 50 speakers.
- Used the spectrogram obtained by STFT from first signal as positive and the rest of the signals as negative examples.

Detection and Response to Anthropogenic Emergency Events using Audio Data Mining

- Designed an audio based system to alert the first responders about events as gunshots, glass breaks and car accidents.
- Used spherical k-mean dictionary learning for feature extraction and random forest for classification with an accuracy of 92%
- Deployed a Raspberry Pi system and developed an android app for first responders to receive real-time notifications.