HARSHIT
Indian Institute of Technology, Kharagpur

EDUCATION

Year	Degree/Exam	Institute	CGPA/Marks
2017	B.ARCH	IIT Kharagpur	8.25 / 10
2012	AISSCE	CBSE	94.6%
2010	AISSE	CBSE	10 / 10

SKILLS AND EXPERTISE

Programming Languages : C, C++, Python, Java, Javascript, HTML/CSS, Visual Basic (Excel)
Libraries and Frameworks : Tensorflow, Theano, Scikit learn, Pandas, NLTK, Flask, IPython
Operating Systems : Windows, Ubuntu   *Cloud Platforms :* Google App Engine, AWS EC2, AWS Elastic Beanstalk

INTERNSHIP

Research Intern | AI & NLP   **Surukam Analytics** | Chennai   *May 2015 - July 2015*
- Implemented **Multi-Label classification** of websites into 422 categories with training data of 20000 websites amounting to **10 GB**
- Applied **BOW model** and improved traditional **Tf-Idf** approach by incorporating class-frequency ; Used idf thresholds to discard outliers
- Deployed **hybrid** approach of three machine learning algorithms: **Naive Bayes, k-nearest neighbour and Support Vector Machines**
- Deployed **Complement Naive bayes** to mitigate the issue of skewness in the training data; Engineered weighted features for weak classes

PROJECTS

TexLens - Text Summarizer

- Developed **Graph** based **Extractive Summarization** tool based on the **Eigenvector centrality** in graph representation of sentences
- Feature matrix using **Tf-Isf** values was used to create Adjacency matrix with Inter-sentence **cosine distance** as the similarity metric
- Deployed **Weighted PageRank** algorithm to rank sentences where weights of in-out edges are cosine similarity values
- Improved the **LexRank** algorithm by incorporating other **Lexical features** - Location , Length and Sentence-to-Centroid cohesion

Facial Expression Recognition (Team Project)

- Developed Human **Facial Expression recognition** system which classifies human face into one of **7 classes** using Deep learning models
- Implemented and trained **Convolutional Neural Networks** in **TensorFlow** over 28000 48*48 pixels grayscale images
- Achieved an **accuracy** of **66%** on test data consisting of 3589 images ; Tools- Python, Tensorflow, Android Studio

Reinforcement based Autonomous navigation

- Implemented **Reinforcement** based learning technique for teaching a **virtual car** in a 2D game (developed in PyGame) to avoid collision
- Raw sensor data represents each **state** in the game; The input data decides the obstacle type(0,1,2) based on their pixel values
- Predicted **Q-values** decide the action to be taken followed by **reward or punishment** as per the new state achieved

Reverse Image Search Engine

- Developed **Content Based Image Retrieval (CBIR)** system by using pixel intensities as the primary feature to quantify image content
- **Histograms in HSV** colour space(with 8 bins/channel) were developed in **OpenCV** to generate **Feature vectors** of training Images
- Feature vectors were mapped to 8*8*8=**512 dimensional space**; Implemented **Chi-squared** similarity as the final ranking algorithm

Mortality Predictor (Competition - Xerox Research Innovation Challenge)

- Developed a **Binary Classification** model to **predict risk of death** in patients admitted to ICU using online ML techniques
- Analysed 31(Vitals & Labs) **time series variables; Engineered** rolling Average, Min, Max, timestamp frequencies as additional features
- Implemented **stacking techniques** to predict the final output with stacking of **Random Forest, KNN and Logistic classifiers**

COURSEWORK INFORMATION

- Machine Learning
- Deep Learning
- Reinforcement Learning
- Digital Speech Processing
- Programming and Data Structures (Theory and Lab)
- Probability and Statistics

AWARDS AND ACHIEVEMENTS

- **Winner** of Global Entrepreneurship Summit **Hackathon** 2017, IIT Kharagpur
- Secured **AIR 31** and **Regional** rank **10** in Regional Mathematics Olympiad (RMO) in Class X
- **Selected** as **one of 50 Indian delegates** to **visit Japan** under **JENESYS** (Japan East Asia Network for Exchange of Students and Youths)
- Recipient of **Central Sector Scheme Scholarship** (CBSE) awarded by the Ministry of HRD
- Selected for prestigious IAFBA **Indian Air Force Scholarship** for meritorious performance in Class XII examination
- Got **Distinction** in Computer Science, AISSCE (Class XII ,CBSE) for being among top **0.1%** in the country

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