Yogesh Kumar
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Education

- **Indian Institute of Technology** — Jodhpur, India
  Ph.D. AI; 8.3/10 cgpa (Mtech AI course work) — *2020 - present*
- **Delhi University** — Delhi, India
  MSc Computer Science; 79.35% — *2017 - 2019*
- **Delhi University** — Delhi, India
  BSc Computer Science; 88.71% — *2014 - 2017*
- **PDDSVM, CBSE** — Vrindavan, India
  12th: 90.4%, 10th: 9.4/10 cgpa — *2009-2013*

Other Academic Qualification

- **UGC NET-JRF**: 99.96 Percentile, Rank-18
- **GATE**: 2019,2020 Qualified

Relevant Projects

Fast Incremental SVDD with the Gaussian Kernel Algorithm:
(Course Project, IIT Jodhpur)
The proposed method in this paper is implemented and improved for outlier detection. The improvement is made by selecting a point as a support vector based on its dynamic distance from the decision boundary. The dynamic distance is calculated by penalizing the distance with the number of iterations in the algorithm. In this way, redundant support vectors are removed from the decision boundary. This helps in better F1 score with fewer support vectors which helps in better generalization (chances of overfitting are reduced) of the algorithm.

Not All Attention Is Needed: Gated Attention Network for Sequence Data:
(Course Project, IIT Jodhpur)
The proposed method in this paper is implemented for sentiment analysis task on Amazon review dataset using Pytorch Library.

Regularizing Neural Networks via Adversarial Model Perturbation:
(Course Project, IIT Jodhpur)
The proposed method in this paper is implemented for image classification task on CIFAR10 and MNIST datasets.

Neural Machine Translation:
(Course Project, IIT Jodhpur)
This project is implemented on English to Marathi dataset using BiLSTM as a encoder and decoder with attention mechanism.

CVPR Plant Pathology Challenge:
(Course Project, IIT Jodhpur)
It is an image classification Kaggle challenge in which an image has to classify to a particular disease. This project is implemented using both non-deep learning techniques (SVM, Naive Bayes, Logistic Regression) and with deep learning techniques (VGG16, ResNet18 and 50, EfficentNetB4 and B7).

Covid-19 FAQ Chatbot:
(Course Project, IIT Jodhpur)
This project is implemented using open source RASA framework using covid-19 FAQ dataset.

Image Segmentation:
(Course Project, IIT Jodhpur)
UNet and FCN32 architecture implemented from scratch using Pytorch library for Cityscape and Nail segmentation dataset.

Blind Watermark Creation and Detection:
(Course Project, IIT Jodhpur)
This project is implemented Using Discrete Wavelet Transform for creating and detecting blind watermarks on images.

Grid World Game using Reinforcement Learning:
(Course Project, IIT Jodhpur)
This project is implemented using Q learning algorithm for finding a path to a random goal in a adversarial grid world environment.

MSc Reserach Project
Text Summarization, Mentor: Prof. Vasudha Bhatnagar *Delhi University*

- **Textual Entailment Based**: Implement and experiment with an existing algorithm based on Textual Entailment. Based on the results of the experiments create a new algorithm that uses graph properties to rank the sentences in the document which performs better for some of the ROUGE metrics.
- **Graph Based**: Implement and experiment with two well-known Text Summarization algorithms TextRank and Corank that are based on the PageRank algorithm. We combine the TexRank and CoRank and evaluate the performance for the different contributions(linear addition of these two algorithms) to the new algorithm.
- **LSA based**: Implement and experiment Latent Semantic Analysis based Text Summarization algorithms and study the effect of stop words as a preprocessing phase. Optimizes the algorithm by adding a step to check redundancy.
- **Frequency based**: Implement an algorithm that uses word frequency to rank the sentences of a text document. Evaluate its performance and compare it with our other implemented algorithms that show word frequency is a good criterion to rank the sentence and can be included in other algorithms.

Plagiarism Checker: This project aims to find copied documents from one another that are submitted as an assignment. Using K-means and hierarchical clustering with Cosine and Jaccard similarities documents clustered together to find similar documents.

Statistical Analysis of Open Source Projects: Statistical analysis of Bug severity, priority, status, create time, resolve time etc. based on different software engineering metrics.

Spent: A chrome extension that keeps track of daily spending and notifies the user when the limit is reached. This project is implemented with Node.js, JavaScript, and HTML.

Technical Skills

- **Programming Languages**: C, C++, R, Python, HTML & CSS, Latex
- **Libraries**: Pytorch, OpenCV, Pandas, Scikit-learn
- **Tools and Software**: Jupyter/IPython Notebook, Git Version Control

Relevant Courses

- **Mathematics**: Linear Algebra, Statistical Techniques, Optimization, Discrete Structures, Calculus and Geometry, Differential Equations, Operational Research
- **AI**: AI, Reinforcement Learning, Data Mining, Information Retrieval, Machine Learning, Deep Learning, Computer Vision, Computer Graphics, NLP
- **Computer Science**: Data Structures and Algorithm, Operating System, Database System, Computer Networks, Computer Architecture, TOC, Digital Electronics, Compiler Design, Design and Analysis of Algorithms

Extra Curricular & Other Qualification

- Participated and was a rapporteur for the**"International Colloquium on Ethics and Governance of Autonomous AI Systems for a Better World"**, held on February 18 & 19 , 2019 organized by Center for Media Studies and supported by Department of Science & Technology, GOI.
- Google India Udacity Challenge Scholar