Anuj Shrivastava

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EDUCATION

Year	Degree/Certificate	Institute	CPI/%
2021-Present	**M.Tech/Computer Science & Engg.**	**Indian Institute of Technology, Kanpur**	**8.7/10**
2016-2020	B.Tech/Computer Engg.	Technocrats Institute of Technology, Bhopal	7.86/10
2015-2016	XII (CBSE)	St. John's Sr. Sec. School, Damoh	81.2%
2013-2014	X (CBSE)	St. John's Sr. Sec. School, Damoh	8.2/10

RESEARCH EXPERIENCE

Implementing Group Authentication Protocols on UAVs |(M.Tech Thesis) Prof. Urbi Chaterjee **May'22-Present**

- Surveyed the literature on group authentication protocols on UAVs.
- Developed group authentication protocols using SRAM PUFs in a prototype UAV consisting of a Pixhawk microcontroller, Raspberry Pi, and a CMOD FPGA.
- Integrating more UAV-specific hardware features such as GPS to make the authentication process more robust when combined with the SRAM PUF.

PROJECTS

IoT Enabled Smart Covid Prevention Door | (CS698T) Prof. Priyanka Bagade **Sep'21-Nov'21**

- Developed a smart entry solution which detects face mask, body temperature, hand sanitization and number of people inside.
- Implemented face mask detection using deep learning and other project features using IoT.

EDA on COVID-19 India Dataset | (CS685) Prof. Arnab Bhattacharya **Aug'21-Sep'21**

- Analyzed the spread of Covid-19 and found the number of cases weekly, monthly, overall and peaks for wave 1 and wave 2 across different levels (district, state, and overall) in the country from the Covid-19 dataset.
- From vaccination dataset, found vaccination status at different levels based on literacy, age, gender, etc., and also estimated the duration of total vaccination.

Intelligent Irrigation System | (CS698T) Prof. Priyanka Bagade **Oct'21-Nov'21**

- Developed a machine learning-based intelligent farm irrigation system on Arduino Mega 2560 board.
- Implemented a 2 layer MLP model for regression that took temperature and humidity values from DH22 sensors and produced the required amount of water flow (with the help of servo motors) for the farm field.

Information Retrieval System for Wikipedia Documents |(CS657)Prof. Arnab Bhattacharya **Feb'22-Mar'22**

- Processed 8331 documents by tokenizing, stemming, lemmatizing, and other text cleaning operations.
- A Boolean Retrieval, Tf-IDF, and BM25 Model-based Information Retrieval System was implemented from scratch. In less than 30 sec, built systems were able to retrieve documents for a query.

Image Classification using Multi-classifier | (CS776) Prof. Priyanka Bagade **Jan'22-Feb'22**

- An augmented dataset was created using transformation methods such as random rotation, random crop, contrast, and horizontal flipping on CIFAR-10 images.
- Two training datasets with and without augmented features were created. A multi-layer perceptron model with 64 neurons in its hidden layer was developed & trained on both datasets.
- All processes, including feed-forward, backpropagation, and image transformation methods, were implemented without any library functions. Proposed model was successfully able to classify images falling into 10 classes.

Climate Change Analysis | (CS685) Prof. Arnab Bhattacharya **Sep'21-Nov'21**

- Analyzed various factors that induce climate change like- Global Greenhouse-Gas Emissions, Rise in Temperature, Melting of Glaciers, Rise in Sea-level, Plastic Waste in Oceans, Deforestation, and Correlation with Endangered Indigenous Species and Natural Disasters.
- Have worked on over 40 datasets, cleaned, pre-processed, and generated results from those datasets.

Computational Linguistics on Indian Languages |(CS657) Prof. Arnab Bhattacharya **Mar'22-Apr'22**

- Pre-trained word vectors: GloVe, CBOW, Skipgram, and FastText were used to find word similarity scores.
- Ngrams model was implemented to identify the most frequently occuring words, letters, and syllables in the AI4Bharat hindi dataset containing 1.86B tokens
- Fine-tuned the IndicBERT model on the NER dataset of the Indian Language Corpus to generate embedding for each word.

EDA on Language-Census Dataset | (CS685) Prof. Arnab Bhattacharya **Oct'22-Nov'22**

- Extracted Census India language data for 2011 and performed linguistic demography based on gender, age, literacy, and geography (states and regions).
- Computed state-wise percentage of the population speaking 1 or 2 or 3+ languages; region-wise top 3 spoken languages; gender-wise age groups and literacy groups speaking 3+ languages, etc.

Topic Modeling on Indian Epics | (CS657) Prof. Arnab Bhattacharya **Feb'22-Apr'22**

- Performed topic modeling on texts from Ayurveda, Ramayanam, and Mahabharath.
- Compared different topic models using evaluation metrics like perplexity and coherence.

Deep Video De-noising | (CS776) Prof. Priyanka Bagade **Jan'22-Apr-22**

- Developed a CNN+RNN-based deblurring cum denoising network to address motion blur in time series data.
- Developed spatio-temporal model results for the DVD dataset provided 23.13 PSNR and 0.86 SSIM scores.

Implemented Machine Learning Models | (CS771) Prof. Nisheeth Srivastava **Aug'21-Nov'21**

- Implemented Supervised and Unsupervised Algorithms like Linear Regression, Logistic Regression, Decision Tree, SVM, Gradient descent, KNN, K-means, and perceptron.
- Implemented clustering algorithms like k-means, kernel k-means, and k-means++ using Gaussian RBF Kernel to cluster a non-linearly separable smiley dataset.

Escaping The Caves (Breaking Cryptosystems) | (CS641) Prof. Manindra Agrawal **Jan'22-Apr-22**

- Analyzed and decrypted various cryptosystems, including Substitution cipher, PlayFair cipher, DES, AES, RSA, and SHA-3.
- Various techniques were used for breaking the above cryptosystems like brute force, frequency analysis, differential cryptanalysis, coppersmith algorithm, etc.

RELEVANT COURSES

- Data Structures & Algorithms(B.E)
- Operating Systems(B.E)
- Computer Networks(B.E)
- Database Management System (DBMS)(B.E)
- Intro to IoT & it's Industrial Applications
- Information Retrival
- Computer Organisation & Architecture(B.E)
- Modern Cryptology
- Data Mining
- Deep Learning for Computer Vision
- Introduction to Machine Learning

POSITION OF RESPONSIBILITY

- **Teaching Assistant:** Computational Linguistics for Indian Languages (CS689A) **Jul'22-Present**
- **Teaching Assistant:** Fundamentals of Computing (ESC101) **Dec'21-July'22**
  - Solving doubts of UG students and mentoring them to improve their programming skills in C-programming. Also involve in evaluation activities like plagiarism checking, grading etc. Helped the Instructor for smooth conduct of the course.

TECHNICAL SKILLS

Programming Languages: C, C++, Python, SQL

Libraries/Software/OS: Numpy, Pandas, Jupyter-Notebook, Visual Studio, Wokwi IoT Simulator, Mission Planner, LaTeX, GitHub, Git, Linux, Windows

ACHIEVEMENTS

- Secured **AIR 378** in **GATE CSE 2021** among **101922** candidates

HOBBIES

- Cycling
- Playing Games
- Listening music
- Playing piano