

Shivam Kumar

☎ +91 9631530940 | @ shivam23004@iiitd.ac.in | 🔗 LinkedIn | 🐙 GitHub | 📍 New Delhi, India

EDUCATION

Indraprastha Institute Of Information Technology, Delhi New Delhi, India
M.Tech (Research) in Computer Science & Engineering; GPA: 8.53/10.00 *Aug 2023 – Present*

Gurukula Kangri (Deemed to be University), Haridwar Uttarakhand, India
B.Tech in Computer Science & Engineering; GPA: 8.87/10.00 *Aug 2019 – Aug 2023*

SKILLS

Interest Areas: LLM, NLP, Speech and Audio Processing, Deep Learning, Machine Learning

Programming: Python, Java, C++, LaTeX

Libraries & Frameworks: SpeechBrain, ESPnet, Kaldi2-icefall, PyTorch, HuggingFace, Scikit-Learn, NumPy, Pandas, Matplotlib, Git

Tools: GitHub, Jupyter Notebook, VS Code, Colaboratory, IntelliJ IDEA.

ACADEMIC RESEARCH EXPERIENCE

FLaMe Research Lab, IIIT Delhi New Delhi, India
Graduate Researcher | Guide: Prof. Md. Shad Akhtar *Aug 2023 – Present*

- Tech Stack: Pytorch, ASR, NLP, Hugging Face, Research Skills
- Worked on benchmarking the ASR system for the Indian language. For this, created a tool (i.e., a UI) for uploading the speech dataset, where our trained models can make predictions. Evaluated the SOTA models like **Whisper** and **Wav2Vec2** for publicly available benchmarks. The next step is improving the Whisper model for code-mixed data.

PROJECTS

Multilingual Complex Named Entity Recognition | [GitHub](#)

- Tech Stack: PyTorch, Deep Learning
- Among the six named entities, we had 33 subcategories of named entities. The task is to build a complex NER model to classify the named entity when an input word is given. We devised the idea to tackle the multilingual problem with an ensemble of **Roberta**-based models trained on different sets of languages (English, Hindi, French, and German) and then used voting-based confidence scoring. Achieved an F1 score of nearly 50% for all four languages.

Reproducing GPT-2 124M Parameters | [GitHub](#)

- Tech Stack: PyTorch, Deep Learning
- Implemented the GPT-2 124M parameters from scratch by taking the reference from this [Attention is All You Need](#) and [GPT-2](#) and [GPT-3](#) paper.
- Increased the performance by using **Flash Attention**, Torch Compile, Gradient Accumulation, and Multi-GPU training (**DDP**).
- At the end, Measured the performance on **Hellaswag** Dataset.

Human Activity Recognition (HAR) using Kernalized SVM | [GitHub](#)

- Tech Stack: Classical ML, sklearn
- Using classical machine learning, developed a model that classifies an image among one of the 15 classes, such as cycling, running, clapping, etc. Applied various image filters and feature extraction techniques like HOG, SIFT, and LBP and evaluated multiple SVM kernels. After all experiments, we achieved a maximum accuracy of 35% with a linear kernel and 67 % with CNN as a feature extractor.

Multi-threaded Programming and Profiling | [GitHub](#)

- Tech Stack: C++, OOPs
- Implemented a basic Linux shell supporting various Linux commands. Enhanced the shell with **multi-threading** capabilities to execute commands concurrently and conducted performance comparisons. This project improved my understanding of system architecture.

Speech Command Classification using GMM | [GitHub](#)

- Tech Stack: **Feature Engineering**, Machine Learning
- Trained GMM classifier to classify from 30 class of speech command words from given audio. This project is done without using DL based model, only classical ML is used.

AWARDS & ACHIEVEMENTS

GATE EXAM: Scored AIR 1809 in GATE 2023; Qualified GATE '22, GATE '23.

JEE Mains: I scored 96.1 percentile in JEE Mains 2019.

FFE Scholar: Foundation for Excellence(FFE) scholar for 4 years in B.tech

POSITIONS OF RESPONSIBILITY

Induction Committee for M.tech/PhD Admission

July 2024 – Aug 2024

Volunteer in the Induction committee for M.tech and PhD Admission.

Teaching Assistant for CSE 102 - Data Structure and Algorithm

Jan 2024 – April 2024

Helping Instructor to run the course smoothly. | [Website](#)

Teaching Assistant for CSE 101 - Introduction to Programming

Aug 2023 – Nov 2023

Conducted tests, and quizzes on time. Also took tutorials. | [Website](#)

HOBBIES

Writting Technical Blog Posts, Badminton, Cricket