AVIK PRAMANICK | 23CS60R78

COMPUTER SCIENCE AND ENGINEERING

EDUCATION

Year	Degree/Exam	Institute	CGPA/Marks
2025	M.TECH	IIT Kharagpur	7.95 / 10
2016	B.Tech.	Govt. College of Engg. & Textile Technology, Serampore (MAKAUT, formerly WBUT)	8.44 / 10
2011	Higher Secondary Examination	West Bengal Council of Higher Secondary Education	75.71%
2009	Secondary Examination	West Bengal Board of Secondary Education	69.33%

PROJECTS

[Ongoing] CAGE Tag Prediction **[Aug'24-May'25]**

M. Tech Project | Prof Pralay Mitra | IIT Kharagpur

• Developing a Deep Learning model to predict the presence of CAGE tags, indicative of Transcription Start Sites, in nucleotide sequences ranging from 0 to 10,000 base pairs.
• Utilizing the predicted CAGE tags to estimate gene expression levels by analyzing large collections of cDNA fragments from various cell lines. Currently achieving a 68% accuracy using a Convolutional Neural Network (CNN) model.

Replicated Database with Sharding and Consistency Using Write-Ahead Logging (WAL) **[Apr'24]**

Distributed Systems Project | Prof Sandip Chakraborty | IIT Kharagpur

• Designed and implemented a sharded database system that ensures data consistency across replicated shards using a Write-Ahead Logging (WAL) mechanism.
• Integrated fault tolerance and high availability by implementing replication and consistent recovery mechanisms across distributed server containers.
• Enhanced load balancing using consistent hashing, enabling scalable and efficient handling of read/write requests across multiple shards.
• Key features include shard-based data distribution, logging for consistency and automatic recovery from unexpected shutdowns.

Automatic Image Captioning **[Apr'24]**

Deep Learning Project | Prof Pawan Goyal | IIT Kharagpur

• Developed encoder-decoder models for automatic image captioning using a CNN-based encoder and RNN-based decoder, achieving a Training Loss of 2% and a Validation Loss of 3%.
• Integrated a Vision Transformer (ViT) as the encoder, paired with a text decoder, to enhance image captioning quality. This approach yielded a Training Loss of 1.8%, while the Validation metrics improved to 2%.
• Evaluated the models using CIDEr, ROUGE-L, and SPICE metrics to measure the quality and relevance of generated captions.

Client-Server Chat Application with FAQ Chatbot **[Apr'24]**

Design Lab Project | Prof Niloy Ganguly | Prof Mainack Mondal | IIT Kharagpur

• Built a peer-to-peer chat system using TCP sockets, supporting multiple client connections (maximum 10 at a time) with features like direct messaging, active client listing and chat history management.
• Integrated a dual-mode FAQ chatbot with options for a simple string-matching model and a GPT-2 based model, allowing users to toggle chatbot functionality on or off.

Lex Yacc and NoSQL for crawling Covid Statistics and News **[Mar'24]**

Design Lab Project | Prof Niloy Ganguly | Prof Mainack Mondal | IIT Kharagpur

• Developed a Python program using Lex-Yacc (PLY) to crawl and extract COVID-19 statistics from Worldometer and news data from Wikipedia, with a menu-driven interface for efficient query-based data analysis, including trend analysis and similarity assessments using the MapReduce paradigm and Jaccard index.

Custom Linux Shell with Built-in Text Editor **[Oct'23]**

Computing Lab Project | Prof Niloy Ganguly | Prof Mainack Mondal | IIT Kharagpur

• Developed a custom Linux shell with features like command history, command piping and support for executing commands in the background, extended with a built-in text editor using the ncurses library.

SKILLS AND EXPERTISE

• **Programming Languages:** Python | C | Java | HTML | CSS | JavaScript | PHP
• **Frameworks & Libraries:** PyTorch | TensorFlow | Keras | Scikit-Learn | Numpy | Pandas | Matplotlib
• **Tools & Technologies:** Docker | Git/GitHub | Socket Programming | Thread Programming | Object-Oriented Programming (OOP)
• **Databases:** SQL | NoSQL

COURSEWORK INFORMATION

Algorithm Design and Analysis | Data Analytics | Machine Learning | Deep Learning | Complex Network Theory | Distributed Systems | Foundations Of Computing Science | High Performance in Computer Architecture | Operating System Design | Computing Lab (Data Structures and Algorithms, Web Scrapping, Linear Programming, Multi-Threading with Synchronization, OS and Socket Programming) | Design Lab (Lex, Yacc, SQL, NoSQL, ML and Deep Learning)

POSITIONS OF RESPONSIBILITY

Teaching Assistant **[Aug'24-Nov'24]**

Programming & Data Structures Lab (UG) | Prof Pralay Mitra | Prof Jibesh Patra | IIT Kharagpur

• Assisted 94 students with coursework, provided tutorials, addressed queries and supported course instructors with invigilation and evaluation duties.