

SWECHA SANJAY

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Education

Indian Institute of Technology Kharagpur <i>B.Tech (Hons.) in Civil Engineering (CGPA: 8.56/10.0)</i>	2024-2028
Arwachin Bharti Bhawan Sr. Sec. School <i>Central Board of Secondary Education (Percentage: 94.8)</i>	2022-2023
Arwachin Bharti Bhawan Sr. Sec. School <i>Central Board of Secondary Education (Percentage: 96.7)</i>	2020-2021

Projects

LHC Jet Analysis NSSC Data Hackathon	Oct. 2025
• Created a custom CNN(ROC-AUC:0.9984) for HLS4ML LHC dataset image classification, surpassing VGG16, DenseNet.	
• Conducted multi-modal analysis comparing image CNNs (96.61% accuracy) and tabular MLP models (83.26% accuracy).	
• Applied PCA for dimensionality reduction on tabular data; determined the MLP model performed optimally without PCA.	
• Designed a CNN Autoencoder and reconstruction error to perform anomaly detection, identifying BSM signals in data.	
Skin Cancer Detection Kharagpur Data Analytics group	Aug. 2025
• Engineered a Multi-Modal DL Model with Image features (ResNet, EffNet, ViT) & tabular data to predict skin cancer.	
• Achieved a 25% increase in predictive accuracy over single-modality models by handling multi-modal dataset inputs.	
• Leveraged a stacked Ensemble (XGBoost, CatBoost , Meta-Learner) to maximize performance on the given metadata .	
• Mitigated Extreme Class Imbalance using a combined resampling strategy and utilized image augmentation .	
Chernobyl Risk Prediction Kharagpur Data Analytics Group	July 2025
• Developed and fine-tuned stacked LSTM RNNs to forecast critical system risk by analyzing multivariate time-series data.	
• Engineered a DL pipeline using Bi-LSTMs, Batch Normalization , and TensorFlow/Keras for a classification task.	
• Implemented data pre-processing using mean imputation , standard scaling , and noise-reduction normalization .	
• Improved the prediction accuracy by 15% over the baseline models through hyperparameter tuning and feature engineering.	
Named Entity Recognition (NER) with BERT Self-project	Sept. 2025
• Fine-tuned a BERT model using the Hugging Face Transformers Library to achieve a 92% F1-score on a custom NER task.	
• Developed an NER system capable of automatically identifying and classifying key entities from large unstructured text.	
• Engineered data-processing pipeline including sub-word tokenization and dynamic attention mask creation for BERT.	
• Demonstrated proficiency in LLM customization and deployment for specialized sequence labeling applications.	

Relevant Coursework

- Courses:** Advanced Calculus, Probability and Statistics, Programming and Data Structures, PDS Lab, Linear Algebra, Numerical Analysis and Complex Analysis, Applications of IoT in Civil Engineering, Geomatics, Strength of Materials
- MOOCs:** ML Specialization, DL Specialization, Pytorch for Deep Learning, Python for Data Science and ML

Technical Skills

- Programming Lang/Libraries:** C, C++, Python, R, HTML, CSS, Numpy, Pandas, Matplotlib, Scikit-Learn, Pytorch
- Software and Tools:** Github, Jupyter Notebook, Visual Studio code, Google Colab, Anaconda, Figma, Canva

Positions Of Responsibility

Student Member Kharagpur Data Analytics Group	Mar 2025 - Present
• Selected as one of 50 members from a pool of 1500+ applicants based on rigorous analytical, puzzle and coding tests.	
• Contributed to intra-society Kaggle competitions, applying advanced ML/DL concepts learned from knowledge sessions.	
Strategist The KGPIan Game Theory Society	Aug. 2025 - Present
• Delivered analysis and presentations on real-world game theory models in modern economics and high-stakes auctions.	
• Organized and moderated competitive simulation games (e.g., Prisoner's Dilemma, Auction Theory) for 50+ members.	

Awards and Achievements

- Winner, NSSC 2025 Data Hackathon:** Achieved **96.61%** test accuracy and **0.9984** ROC-AUC in using a custom CNN.
- Selected to represent my school in the Open School Volleyball Competition, competing against teams at the **State Level**.
- Achieved **Gold Medal**(Volleyball) in Inter-Hall General Championship at IIT Kharagpur, victorious over all other halls.