

SEMANTI GHOSH

3rd Year BTech Student at IIT Kharagpur (Year of Graduation 2026)

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I am a third-year undergraduate student at the Department of Industrial & Systems Engineering, Indian Institute of Technology, Kharagpur. My course of study involves Statistical Learning, Optimization, Operations Research, and Evolutionary Algorithms. I intend to minor in Computer Science alongside majoring in Industrial & Systems Engineering. My area of interest includes Machine Learning and Data Science.

EDUCATION

Year	Degree/Exam	Institute	CGPA/Marks
2026	B.TECH	IIT Kharagpur	8.74 / 10
2022	AISSCE	Delhi Public School, Ruby Park, Kolkata	98%
2020	ICSE	La Martiniere for Girls, Kolkata	97.2%

INTERSHIPS AND PROJECTS

- Lattice Reduction to solve the Shortest Vector Problem** May, 2024 - July, 2024
Guide: Prof. Sanjay Bhattacharjee, University of Kent, UK
- Studied lattice reduction algorithms to solve the Shortest Vector Problem required in Post-Quantum Cryptography (PQC)
 - Implemented the LLL algorithm for lattice reduction in C and C++
 - Used C++ libraries for arbitrary precision arithmetic like FPLLL, GMP, MPFR for lattices with large numbers
 - Calculated and compared the root Hermite Factor for different bases (to compare the quality)
- Classification of Functional Near Infrared Spectroscopic Data using GCNN.** May, 2024 - June, 2024
Guide: Prof. Amit Konar, Jadavpur University, Kolkata
- Recorded the brain signals of subjects taking MCQ tests using fNIRS device along with their emotions
 - Modified and augmented the data recorded and generated graphs from the data
 - The graphs generated became the input graphs for the GCNN
 - Used Python libraries Pandas and NumPy for reading the data and NetworkX for obtaining graphs and their properties
 - Used PyTorch for implementing the main graph convolutional neural network
- Object Detection from Epic Kitchen dataset using YOLO V3 algorithm (self-project)** July, 2023
- Worked on detecting a spoon from the Epic kitchen dataset
 - Used YOLOv3 pre-trained convolutional neural network to detect objects

SKILLS AND EXPERTISE

Mathematics for Data Science: Probability and Statistics | Stochastic Processes | Linear Algebra | Operations Research

Languages and Software: Python | C | C++ | CPLEX

Python Libraries: NumPy | SeaBorn | Pandas | TensorFlow | Keras | PyTorch | NetworkX | Matplotlib

C++ libraries: STL | arbitrary precision data handling libraries like GMP, MPFR, FPLLL

Algorithms: Basic algorithms (search, sort, divide and conquer, dynamic programming, graph and tree traversal algorithms) | ML algorithms (Linear Regression, Classification algorithms like logistic regression, decision tree, k-nearest neighbours) | DL algorithms (perceptron, MLP, CNN, RNN, GCNN)

Tools: Github | Visual Studio Code | Google Colab | GDB debugger | Sublime Text

Operating Systems : Windows 11 | Linux | Windows Subsystem for Linux (WSL)

COURSEWORK

Mathematics: Advanced Calculus | Linear Algebra | Probability and Statistics | Transform Calculus

Computer Science: Programming and Data Structures | Programming and Data Structures lab | Algorithms lab

Optimization: Operations Research (part I and II) | Operations Research lab

Industrial: Work System Design | Work System Design lab | Management of Inventory Systems | Engineering Economy

CERTIFICATIONS

Machine Learning Specialization

Coursera - Stanford Online / DeepLearning.ai

Supervised Machine Learning | Regression | Classification | Advanced Machine Learning Algorithms | Unsupervised Learning | Recommenders | Reinforcement Learning

Deep Learning Specialization

Coursera - Stanford Online / DeepLearning.ai

Neural Networks | Logistic Regression | Improving Neural Networks | Hyperparameter Tuning | Regularization (L2, dropout) | Normalization | Optimization Algorithms | Structuring Machine Learning Projects | CNN | Transfer learning | YOLO | Face Recognition | Sequence Models | RNN | Language Modelling | Sequence Generation | GRU | LSTM | Word Embeddings | Sentiment Classification | Attention Mechanism

EXTRA CURRICULAR ACTIVITIES

Member, Technology Robotix Society (TRS): learnt to use Arduino UNO, TinkerCad, participated in Winter School for Computer Vision

Student Volunteer at National Service Scheme (NSS): went on plantation drives, walked in rallies to raise awareness among villagers, volunteered in local hospitals, taught in village schools. Received a certificate for making a model of the Chandrayan Rover as teaching, learning material for village schools.