

# Satadru Halder

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## Professional Summary

Final-year B.Tech student in Electronics and Communication Engineering at IIIT Kalyani, with a strong interest in **AI product development** and **data analytics**. Experienced in building real-world ML projects that extract insights and improve decision-making. Passionate about **leveraging data, feedback, and user-centric design** to drive product innovation in fast-paced environments.

## Technical Skills

**Languages:** Python, C, SQL

**Libraries & Tools:** NumPy, pandas, matplotlib, seaborn, scikit-learn, Arduino, MySQL, TensorFlow

**Machine Learning:**

- **Supervised:** Linear Regression, Logistic Regression, Decision Trees, k-NN, SVM, Naive Bayes
- **Unsupervised:** K-Means Clustering, Expectation Maximization, PCA, Gaussian Mixture Models
- **Probabilistic Models:** Bayesian Learning, Hidden Markov Models, Bayesian Networks
- **Neural Networks:** Perceptron, Backpropagation, Multilayer Networks
- **Other:** CRF, MEMMs, LDA, Instance-Based Learning, Gradient Descent

**Concepts:** EDA, Model Evaluation, Bias-Variance, Overfitting, Inductive Bias

## Projects

### Personal Finance Dashboard

Designed and built a dashboard to process bank transaction data (CSV), classify expenses using ML/NLP, and visualize key financial insights such as income vs expenses, category-wise spending, and monthly trends.

**Impact:** Automated over **80%** of expense classification and improved financial tracking using data insights.

**Tech:** Python, pandas, seaborn, matplotlib, scikit-learn, MySQL

### **Waste Classification using Microcontroller and ML**

Built an image classification system to categorize waste into types, with hardware execution using Arduino. Based on the model output, a servo motor rotated to indicate the bin and category, improving waste sorting accuracy.

**Impact:** Demonstrated how AI predictions can trigger real-world, user-actionable outputs.

**Tech:** Python, TensorFlow, Arduino

### **Fake News Detection using Machine Learning**

Created a Random Forest-based classifier using NLP to detect fake news articles. Performed feature extraction and model evaluation using accuracy and F1-score.

**Impact:** Gained experience in handling text data, classification, and model validation in real-world contexts.

**Tech:** Python, scikit-learn, pandas

### **Semi-Automatic Vehicle (Smart India Hackathon 2024)**

Developed a semi-automatic vehicle controlled via hand gestures using MPU6050 and Bluetooth, with real-time obstacle avoidance.

**Impact:** Showcased teamwork, problem-solving under constraints, and innovation in hardware-software integration.

**Tech:** Arduino, C, sensors

## Achievements

🏆 Grand Finalist – Smart India Hackathon 2024 Hardware Edition ([Certificate](#))

🏆 Winner – Ideapool (RISE Foundation, IISER Kolkata) – Gesture-Controlled Vehicle for Amputees ([Certificate](#))

🏆 Winner – Enigma Maze Competition (IIIT Kalyani) – Autonomous maze-solver using PID algorithm ([Certificate](#))

## Education

### **B.Tech. in Electronics and Communication Engineering**

**Indian Institute of Information Technology, Kalyani (2022–2026)**

**Current CGPA:** 7.69/10

[[View 6th Semester Grade Sheet](#)]

## Relevant Coursework

**Machine Learning (Spring 2024–25), IIIT Kalyani | Grade: A | Course Code: CSC602 | Credits: 3**

**Instructor:** Dr. Oishila Bandyopadhyay | [[View 6th Semester Grade Sheet](#)]

**Topics:** Decision Trees, Neural Networks, Bayesian Learning, Expectation Maximization, Clustering (K-Means, GMM), PCA, SVM, HMM, CRF, LDA, Instance-Based Learning, Reinforcement Learning

## Languages Known

English (Fluent), Hindi (Conversational), Bengali (Native)