

# Arnab Singha

M.Sc.in Computer Science

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## EDUCATION

- **M.Sc. in Computer Science** 2024 - currently running  
*Ramakrishna Mission Vivekananda Educational and Research Institute, Belur* Cgpa: 6.67 (till 1st Sem)
- **B.Sc. Honours in Computer Science** 2021 - 2024  
*Midnapore College (Autonomous), affiliated to Vidyasagar University* Cgpa: 8.19
- **Higher Secondary** 2019 - 2021  
*Midnapore Collegiate School* Percentage: 85

## PERSONAL PROJECTS

- **A Comparative Study of Classification Algorithms on the EMNIST dataset** November 2024  
*A comprehensive evaluation of machine learning classification algorithms, including Logistic Regression, Softmax Regression, Decision Tree, Random Forest and A custom Two-Layer model using Softmax Regression on the EMNIST dataset to analyze their effectiveness in ML based handwritten character recognition.*
- **Comprehensive Regression Analysis to Predict Sales Based on Advertising Data** September 2024  
*This project involves applying and comparing various regression techniques - including linear, polynomial and regularization techniques (e.g. Ridge, Lasso, ElasticNet) - to predict sales based on advertising data, and evaluation using various evaluation metrics*
- **Vision-Guided Robotic Manipulation** April 2025  
*A Computer Vision-Integrated Robotic Arm for Real-World Object Interaction using ESP32, opencv, and IoT*
- **Object Detection using YOLO in qemu emulated Raspberry Pi connected to a Kafka network** May 2025  
*Object detection using YOLOv11 in a Qemu emulated Raspberry pi and sending the detected images to remote machine through Kafka.*
- **Segment display design for Bengali characters** August 2024  
*A Segment display design (43 segment) for Bengali and English characters (vowels, consonants, vowel tones (matra) and numerals) along with a decoder circuit design.*
- **Chatbot : Neutron** February 2025  
*A basic LLM powered chatbot for general purpose queries using Google Gemini and Streamlit.*
- **Exam Management System** April 2023  
*A basic exam management system with account facility, schedule, notice and results. Inbuild MCQ question and answering system with answer checking facility on the go.*
- **Phone Book** July 2021  
*A simple app for storing contacts of people using HTML, CSS, JS and Bootstrap.*
- **Basic Text Editor** February 2024  
*A basic text editor app made with java swing and AWT.*
- **Document Scanner** April 2025  
*A simple document scanner application written in python using open-cv and some principles of computer vision.*
- **Sorting Animation Application** February 2024  
*An application visualizing bubble sort and selection sort algorithm using HTML,CSS,JS and Java AWT (Separate two versions)*
- **Others**  
*Models using DL and ML, Analogue clock, GUI Calculator, Obstacle avoiding car, Edge avoiding Car, Simple robotic arm, Frontend projects*

## TECHNICAL SKILLS

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- **Programming in:** C, C++, C#, Java, Python, Linux Shell Programming, Visual Basic
- **Web technologies:** HTML, CSS, JavaScript, VBScript, Node.js, Express.js, Servlet, JSP, PHP, Flask, Streamlit
- **Data Structures:** Array, Stack, Queue, Linked List, Tree, Graph, Hashing, Heap
- **Algorithms:** Sorting (Mergesort, Quicksort, Heapsort, Radixsort etc.), Searching, Asymptotic Analysis, Graph Algorithms (Graph traversal, shortest path etc), Randomized Algorithms, Greedy Methods, Dynamic Programming
- **Tools:** Microsoft Office, Google Colab, Jupyter Notebook, VS Code, ChatGPT
- **IoT and Hardware:** Basic Digital Electronics, Computer Architecture, Microprocessor, Arduino, Raspberry Pi
- **Software Project Management**
- **Database Management System and SQL**
- **Computer Graphics, Image Processing, Computer Vision**
- **Large Language Models and RAG**
- **Others:** Machine Learning, Deep Learning, Data Visualization, LaTeX, Git