**Harsh Sagar**

Indian Institute of Technology Madras +91 6352010302 | [harsh.sagar2107@gmail.com](mailto:harsh.sagar2107@gmail.com) | [**Github**](https://github.com/harshs21/Machine-Learning-Projects.git) **Linkedin**

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| **EDUCATION** | | | | | | |
| Program | | Institution | | CGPA/% | | Year of Completion |
| Dual Degree in Biological Sciences | | Indian Institute of Technology, Madras | | 7.94 | | 2019-2024 |
| XII (GSEB) | | Best High School, Ahmedabad | | 80% | | 2019 |
| X (GSEB) | | Best High School, Ahmedabad | | 87.17% | | 2017 |
| **SCHOLASTIC ACHIEVEMENTS** | | | | | | |
| * **Only** student from **2019 batch** to achieve **Panasonic Scholarship Program** * **Gold Medal** for Class Rank 1, cleared 1st Level and secured **Int. Rank 3359** in 2nd Level of National Science Olympiad in **Class X** * Secured International **Rank 859** in International Science Olympiad in **Class IX** conducted by **Science Olympiad Foundation (SOF)** | | | | | | |
| **RELEVANT COURSES AND SKILL** \*Completed Prof. Course, \*\* Coursera, \*\*\*NPTEL | | | | | | |
| * Data Structures & Algorithms for Biology\* | | | * Biostatistics\* | | * Fundamentals of Operation Research\* | |
| * Statistics for Data Science with Python\*\* | | | * Convolutional Neural Networks\*\* | | * Introduction to DL & NNs with Keras \*\* | |
| **Tools Used:** Angular, TypeScript, HTML, CSS, Bootstrap , Node.js, APIs **Programming Languages:** C, SQL, Python, React Native | | | | | | |
| **WORK EXPERIENCE** | | | | | | |
| **ML Engineer Intern FN MathLogic Consulting Services Gurgaon**  *May’23 – July ‘23* | *Developing a Conversational Question Answering System using Large Language Models (LLMs)* | | | | | |
| * Explored **LLM memory retention** via various **model finetuning methods** on **ICICI Lombard Policy QnA data** * Implemented **Transfer Learning** on Microsoft’s **DialoGPT** model that retained chat memory for **4-5 conversations** * **Nodejs** based frontend interacted with user. **Dialogflow** was used to detect intentions from user messages * **FastAPI** based backend was used to call **LLM model** to generate answer and send them back to frontend | | | | | |
| *Document Parsing for Question Answering using LLMs with Langchain framework* | | | | | |
| * Transformed **ICICI Lombard docs** into chunks, each were converted to embedding using **LLM/encoder-only** model * Used **Langchain** & utilized **Flan-T5 model** as **LLM** & **embedding** of **HuggingFace** platform led to **30% rouge score** | | | | | |
| **Software Intern Street Style Store** *May’22 – Aug’22* | *Conversation Classification for Enhancing User Experience* | | | | | |
| * Worked on **Classification** of conversation between user & agent regarding online order to improve user experience * Utilized **N-grams** stored as **Bag of Words** & compared **Recall values** for SVM model that gave **96.4%** accuracy * Used **Docker** & managed deployment on **AWS** infrastructure,configured **SQL database** for data storage & retrieval * Implemented **CI/CD** pipelines to automate build, test, & deployment phases, enhancing operational efficiency | | | | | |
| **RESEARCH EXPERIENCE** | | | | | | |
| **ML Research Intern IIT Varanasi** [**Research Paper**](https://link.springer.com/article/10.1007/s12161-022-02379-z)  *June’21 – July’21* | **Machine Learning for Milk Foam Analysis, Guide: Prof. Abhishek Dhoble** | | | | | |
| * Worked on Classification of **Surfactants** to study milk foam quality as demand for **Cappuccino foams** has increased * **Randomforest** achieved **0.955 roc-auc score** & **88.1% test accuracy**, also applied algorithms eg **SVM, XGBoost etc** * Explored **Casein** reaction with **surfactants**, this study also got published as the **research paper** in **Springer Nature** | | | | | |
| **DDP PROJECT**  **IIT Madras**  *July’23- Ongoing* | **Evaluating ML models for Chest X-ray of Diseases, Guide: Prof. Ganapathy Krishnamurthi** | | | | | |
| * Applied **Transfer Learning** on **Ensemble** of **CNN** models & **Self Supervised** methods such as **MoCo** & **Vision Transformers** finetuning for Pneumonia detection * **Self Supervised** models performed better with **MoCo** model obtaining **98.7%** test accuracy & **Vision Transformers** obtained **97.5%** test accuracy | | | | | |
| **COURSEWORK** | | | | | | |
| **Monte Carlo Simulation [BT 2042: Fundamentals of Biophysical Chemistry]** | | | | | | |
| * Observed polymer assemblies using **Monte Carlo Metropolis criterion** in **matlab** at different interaction energies between atoms * When interaction energy is **low** the polymer formed aggregate. When only some atoms can interact then polymer had more energy | | | | | | |
| **PROJECTS** | | | | | | |
| **To-Do List Web Application (Angular)** *Jul’22-Aug’22* | | | | | | |
| * Developed dynamic & user-friendly To-Do List web application using Angular framework, allowing users to efficiently manage time * Implemented features to add, delete, & update tasks, along with the capability to create & manage multiple sub-todos within each task | | | | | | |
| **Bus Tracking Web Application** *Jul’22- Aug’22* | | | | | | |
| * Developed real-time bus tracking web application for campus transport. Devised user interface & backend logic to display live bus location * Utilized GPS data from buses via APIs to provide accurate real-time coordinates. Implemented features for route visualization, bus arrival predictions, and user-friendly interface. | | | | | | |
| **Rent A Car Application using Angular** | | | | | | |
| * Built and maintained a dynamic Single-Page Application (**SPA**) using Angular, empowering efficient car rental management * Implemented admin functionalities for cars, brands, colors & services, empowering efficient data management. | | | | | | |
| **POSITION OF RESPONSIBILITY** | | | | | | |
| **Computer Vision & Intelligence Club Project Member, Shaastra 2022** *June’21 – April’22* | | | | | | |
| * Worked on **YOLO v5 model** for detecting circuit components and the **mAP** score of the model evaluated with 25 images is **92.7%** * Detected **terminal points**, **nodes** in circuit using **BFS algorithm** and generated netlist about connectivity of components with others | | | | | | |
| **EXTRA-CURRICULAR ACTIVITIES** | | | | | | |
| **Sports** | * Selected for NSO Fitness program and also participated in Samanvay Marathon 2019 | | | | | |