Arindam Chakraborty

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EDUCATION

OP JINDAL UNIVERSITY — **Raigarh, Chhattisgarh, IN**
Bachelor of Technology — **June 2024**
Computer Science and Engineering
Cumulative GPA: 9.25/10.0
Relevant Coursework: Data Analysis; Database Management System; Software Engineering; Operating Systems; Data Structures and Algorithms; Machine Learning; Discrete Mathematics;Deep Learning

OP JINDAL SCHOOL — **Raigarh, Chhattisgarh,IN**
Relevant Coursework: Physics, Chemistry, Biology, Mathematics — **Mar 2018 - Apr 2019**
Academic Score: 82.3% (CBSE)

PROFESSIONAL SUMMARY

Software Engineer with expertise in designing and developing scalable backend systems, middleware platforms, and RESTful APIs using Python. Skilled in building data processing pipelines, integrating databases, and optimizing system performance for real-time analytics. Experienced in applying machine learning and deep learning techniques for tasks such as object detection, classification, and infrastructure assessment. Adept at collaborating in interdisciplinary teams, writing efficient, reusable code, and architecting reliable cloud-native solutions.

WORK EXPERIENCE

Indian Institute of Science (IISc) — **Bengaluru, KA, IN**
Project Associate I — **Aug 2025 – Present**

- Designed and developed scalable, microservices-based backend architectures for real-time crowd-sourced road data collection using MQTT, Kafka, and Python (Django/Flask/FastAPI).
- Built data ingestion and processing pipelines for high-throughput sensor and IoT data, integrating TimescaleDB, and PostgreSQL for geospatial analytics and road quality assessment.
- Architected cloud-native, containerized (Docker) solutions ensuring scalability, reliability, and fault tolerance.
- Collaborated with interdisciplinary teams to implement distributed systems and explore Rust for high-performance data processing.

Technology Innovation Hub on Autonomous Navigation (TiHAN)-IIT Hyderabad — **Hyderabad, TG, IN**
Junior Research Assistant Fellow (JRAF) — **Nov 2024 – Aug 2025**

- Engineered adaptive SDV architectures to integrate AI and machine learning solutions across diverse platforms, including edge devices, cloud environments, and web-based systems.
- Developed AI-driven vehicle systems: Designed a Software-Defined Vehicle (SDV) Dashboard and a remote monitoring system with AI-assisted emotion detection for enhanced user experience and safety.
- Engineered autonomous navigation solutions: Implemented camera-based object and obstacle detection using YOLO to improve real-time vehicle perception.
- Built scalable middleware platforms: Developed robust real-time data processing architectures, ensuring seamless API integration and cross-platform compatibility for cloud, edge, and web-based systems.
- Designed smart transportation features: Created an AI-driven announcement system for an autonomous campus shuttle, enabling context-aware and real-time passenger notifications.

HARTING India Private Limited — **Bengaluru, KA, IN**
Student Intern — **May 2023 – Dec 2023**

- **MLOps team**
- Designed efficient modules for machine learning pipelines, emphasizing scalability and adaptability across cloud and on-premise environments.
- Implemented reusable software modules to automatically train computer vision models, track parameters & data used. Integrated image data labeling modules to label data for computer vision model training & validation.
- Implemented Fine-tuning module to minimize catastrophic forgetting for computer vision model
- Devised an adaptable architecture for executing machine learning models across diverse computing environments, including cloud, on-premise, web, and edge systems.
- **Asset Administrative Shell/I4.0 team**
- Worked for the development of Asset Administrative Shell (AAS) adhering to IDTA standards, utilizing Asset Administration Shell (AAS) principles.
- Developed reusable software module to programmatically generate AAS (submodels and metamodels), streamlining the process and ensuring conformity to industry standards.
- Innovated methods for seamless editing of submodels within the Asset Administrative Shell (AAS) file, enhancing efficiency and flexibility in data management. Implemented protocols to establish real-time machine-to-AAS communication, demonstrating advanced interoperability capabilities in industrial settings.

PROJECTS

Object Detection with DINO and COCO Evaluation — **Sep 2024**

- Developed a computer vision model using DINO with COCO-style annotations to perform object detection tasks with high precision.

- Evaluated the model's performance, achieving 91.1% AP at IoU=0.50 and 70.4% AR across various object sizes, improving detection accuracy for medium and large objects by 72.3%.
- Optimized bounding box regression and classification loss, resulting in significant reductions in GIoU loss and classification error during training.

AI-powered interview system with an avatar interface, driven by a fine-tuned Mistral 7B language model. **Apr 2024**

- Developed an AI-powered interview system with an interactive avatar interface to simulate realistic candidate interactions and enhance engagement.
- Fine-tuned the Mistral 7B language model on domain-specific interview datasets using Hugging Face Transformers and LoRA for task-specific dialogue.
- Integrated NLP capabilities for response evaluation, leveraging semantic similarity, sentiment analysis, and scoring logic to generate recruiter insights

IoT based crop prediction model **Mar 2023**

- Created a Raspberry Pi-driven solution using sensors to forecast ideal crops based on real-time environmental data stored on Firebase, resulting in reduced fertilizer dependency.
- Implemented analytics to evaluate crucial factors like temperature, humidity, soil pH, and rainfall, facilitating tailored crop recommendations for enhanced sustainability in agriculture.

IoT based pest detection model **Jan 2023**

- Developed IoT middleware for real-time pest detection and management using Python, integrating cloud data solutions for analytics
- Device equipped with Raspberry Pi components detects crop pests and recommends precise pesticide solutions, curbing pesticide dependency and resistance.
- Supported by a web application, this system offers convenient access to pest management strategies, promoting sustainable agriculture and environmental conservation.

ACTIVITIES

IEEE SOCIETY STUDENT BRANCH OPJU **Raigarh, CG**

Branch Secretary **Apr 2023 – May 2024**

- Served as the record keeper and historian of our esteemed Student Branch.
- Organized and advertised 5+ quarterly networking and learning events with 300+ participants at OPJU

OP JINDAL UNIVERSITY NSS **Raigarh, CG**

Volunteer **Nov 2022 – Present**

- Organized and facilitated computer literacy programs in collaboration with local schools and community centers.
- Worked closely with students, providing them with hands-on training and guidance on fundamental computer skills. From teaching them basic software applications to internet navigation aim to empower these students with the knowledge and confidence to navigate the digital world.

ADDITIONAL

Technical Skills: Python,Flask,Django, FastAPI, REST APIs, Pytorch, Tensorflow, Scikit-learn, Linux, Numpy, Pandas, SQL
Tools & Platforms: Docker, MySQL, SQL Server, Amazon EC2,Amazon IoT Core.
AI & GenAI Technologies:Mistral 7B, LLaMA, GPT-2,NanoGPT, Hugging Face Transformers, LangChain, LoRA, Prompt Engineering, Retrieval-Augmented Generation (RAG)
Languages: Fluent in English; Conversational Proficiency in Bengali, Hindi
Certifications & Training: Data Science Using Python Programming., Internet of Things, Introduction to cybersecurity, Cybersecurity Essentials,Deep Learning Specialization*(in progress)*,Machine Learning Specialization*(in progress)*