

# Mainak Malay Saha

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## Objective

Motivated Software Engineer with hands-on experience in full-stack development, data engineering, and applied machine learning. Skilled in designing scalable systems, building intuitive user interfaces, and deploying data-driven solutions using modern frameworks and cloud platforms. Strong foundation in computer science principles, with proven ability to learn new technologies quickly and collaborate across technical and non-technical teams. Passionate about developing impactful software that solves complex real-world problems.

## Education

### Arizona State University (ASU)

12/2025

Master of Science in Robotics and Autonomous Systems (Artificial Intelligence)

GPA: 3.71

*Relevant Coursework:* Artificial Intelligence, Real-Time Embedded Systems, Machine Learning Acceleration, Knowledge Representation & Reasoning, Space Robotics & AI, Data Visualization, Distributed Systems.

### Terna Engineering College, India

06/2024

Bachelor of Engineering in Computer Engineering

GPA: 3.3

## Technical Skills

**Programming & Scripting:** Python, C++, JavaScript (React.js, Node.js), TypeScript, SQL, Rust

**Web Development:** HTML5, CSS3, Responsive UI Design, Full-Stack Development, API Integration

**Cloud & DevOps:** AWS (EC2, S3), Azure, Docker, Git, CI/CD, REST APIs

**Data Science & ML:** TensorFlow, PyTorch, scikit-learn, OpenCV, Pandas, NumPy, MLOps

**Data Engineering & Analytics:** MongoDB, Data Pipelines, Feature Engineering, Spark, Cassandra

**Visualization & BI:** Tableau, Power BI, Matplotlib, Seaborn, Excel (Advanced)

## Experience

### Graduate Research Assistant, ASU Center for Engagement Science — Adidas, ASU

05/2025 – Present

- Collaborated with Dr. Aurel Coza on a multidisciplinary project integrating real-time video analytics and motion analysis for enhanced athletic performance feedback.
- Engineered video processing pipelines using Swift and OpenCV to detect and classify human movement patterns in real time, supporting future applications in audience engagement analytics.
- Designed and implemented algorithms to extract actionable insights from visual and biometric data, simulating decision models relevant to CTV ad interaction and personalization.
- Worked cross-functionally with UI/UX and data science teams to ensure system performance, usability, and data fidelity in mobile deployment environments.

### Graduate Research Associate, TEAL Lab — Arizona State University, Tempe, USA

08/2025 – 10/2025

- Built the *Audio-Vibration Rating Explorer*, an interactive web application to evaluate how four vibration designs map to 1,000+ real-world sounds (4,000+ ratings).
- Designed and deployed a real-time audio-to-vibration generation system, leveraging ML models for feature extraction, classification, and vibration mapping.
- Implemented synchronized audio & vibration playback with real-time waveform and spectrogram visualization (WaveSurfer.js), including A/B comparison across designs.
- Optimized deployment and scalability by using AWS EC2 for hosting and model inference, ensuring low-latency interaction and robust performance.

### Full-Stack Developer, The Language Network, India

08/2021 – 12/2022

- Designed and developed a full-stack web platform and LMS using React.js, Node.js, and MongoDB, enabling scalable user management and seamless integration with 5+ third-party marketing tools.
- Implemented SEO/SEM strategies using SEMrush and Google Analytics, increasing search engine visibility by 60% and driving 10+ high-value keywords to first-page ranking.
- Built custom dashboards using Salesforce and other analytics tools to monitor user engagement, traffic analytics, and campaign conversion metrics, contributing to a 50% increase in overall site traffic and interaction rates.
- Collaborated with content, marketing, and product teams to optimize platform performance, enhance UI/UX, and support growth marketing initiatives.

## Project

### Emotion Classification — Distinguishing Excitement and Fear from Physiological Data

Present

- Developed ML models to classify biometric signals (heart rate, SpO<sub>2</sub>) and distinguish between excitement and fear in real time, simulating audience engagement monitoring for CTV environments.
- Applied advanced signal processing for feature extraction and improved classification accuracy using CNN and LSTM architectures.
- Validated models using real-world physiological datasets and optimized for real-time deployment, emphasizing performance and responsiveness.
- Designed interactive visualizations using Matplotlib and Seaborn to represent emotional state transitions, signal patterns, and model performance metrics.