

JEEVANT PRAKHAR SINGH

🌐 Portfolio 📩 jeevantprakharsingh2004@gmail.com 💬 Jeevant Singh 🌐 Sloththelazy

Education

Indian Institute of Management

Summer Program in Management

May 2024 – June 2024

Udaipur, Rajasthan

Manipal University

Bachelor of Technology in Computer Science, CGPA: 9.1/10

Sep. 2022 – May 2026

Jaipur, Rajasthan

Experience

ISRO Space Applications Centre (SAC)

Research Intern

June 2025 – Ongoing

Ahmedabad, Gujarat

- Developed **semantic communication system** for image transmission using **Vision Transformers** and **YOLO** to intelligently filter and transmit only critical image information, reducing communication pipeline overhead.
- Deployed optimized models on **FPGA** and **Jetson boards** for real-time inference, achieving low-latency processing suitable for resource-constrained space applications.

ABB

Research Intern

May 2024 – August 2024

Bengaluru, Karnataka

- Architected **federated learning framework** using **TensorFlow** and **Python** for **predictive maintenance** and **anomaly detection** across distributed IoT sensors.
- Achieved **20% reduction** in equipment failures and **15% improvement** in detection accuracy through optimized ML pipeline.
- Implemented **differential privacy** mechanisms ensuring data security and regulatory compliance across **decentralized networks**.

Projects

FireStream: Edge-AI Fire Detection System | Python, NVIDIA DeepStream, Docker, Kubernetes, Cloud Run

Ongoing

- Architecting event-driven edge-AI pipeline using **NVIDIA DeepStream SDK** and **YOLO11** for real-time fire detection on **Jetson Orin AGX**, automatically activating RTSP video streams only upon fire detection to optimize bandwidth.
- Implementing **TensorRT optimization** for YOLO11 models achieving low-latency inference on edge devices, and developing **Docker containerization** with **Kubernetes orchestration** for scalable multi-camera deployment.
- Building production-grade system with **GStreamer pipelines** and **PyDS bindings** for metadata extraction, enabling intelligent monitoring across distributed camera networks.

Semantic Communication with ViT and CNNs | Python, Tensorflow

Ongoing

- Adapted ViT and CNNs for semantic communication, enhancing the model to process **high-resolution 512x512** images, a significant increase from the original 32x32 input.
- Engineered a **ViT and CNN encoder** and **hybrid ViT and CNN based decoder** architecture, scaling model parameters from 13.8M to **70M** to improve robustness and learning capacity for complex data.
- Integrated channel simulation layers (**AWGN, Rayleigh, Rician**) and utilized **TensorFlow Compression (GDN)** for efficient model implementation, tracking performance with **PSNR** via **TensorBoard**.
- Performed **Joint Source-Channel Coding** for a robust communication pipeline which is efficient in bandwidth usage for information transmission. Used **Channel State Information technique** for making the model more robust to changes in the channel state.

Secure Client Authentication using Blockchain in Federated Learning | Python, Solidity, Truffle, Ganache

Jan 2025

- Engineered a **blockchain-integrated federated learning** system using **Ethereum smart contracts** to ensure transparency, data integrity, and decentralized trust in model updates across financial institutions.

COVID-19 Prediction using Scientific Machine Learning (SciML) | Julia, SciML, Docker

May 2024

- Built **physics-informed neural network** using **Julia** and **SciML** framework, combining **differential equations** (SIR/SEIR models) with data-driven ML to forecast COVID-19 spread dynamics.
- Achieved **85% prediction accuracy** for infection rate trends through **hyperparameter optimization** and integration of real-world epidemiological data.

Technical Skills

Languages: Python, C++, Julia

Technologies & Frameworks: Linux, Docker, GitHub, DeepStream, GStreamer, Kubernetes, Weights and Biases, Roboflow

Cloud Services: AWS (EC2, S3), GCP, Azure

Extracurricular

Semi-Finalist in MUJ HackX 2.0

- Ranked among the top 10% out of 250 teams in a prestigious university hackathon for innovative project development.

Selected for Smart India Hackathon (Nationals)

- Advanced to the second round, chosen from over 250 teams for problem-solving skills and technical expertise.

1st Runners-up in MUJ MUN

- Awarded 1st Runners-up in Model United Nations (MUN) for outstanding performance in debate and negotiation.

Dean's Excellence Award

- Received the Dean's Excellence Award for achieving one of the highest GPAs in the 3rd, 4th, 5th and 6th semesters, demonstrating academic excellence.