

# GOUTHAM A S

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## EDUCATION

### Indian Institute of Technology, Jodhpur

Aug 2023 – May 2027

Bachelor of Technology, Electrical Engineering, CGPA: 7.36

### CBSE Board

2023

Senior Secondary, 97.8%

### ICSE Board

2021

Secondary, 96%

## EXPERIENCE

### Inter IIT Tech Meet 13.0 | Kalyani Bharat Forge, Autonomous Swarm Navigation | GitHub

Dec 2024

- Built a centralized intelligence system for robot **swarm navigation**, achieving a **35% reduction in pathfinding latency** in unpredictable environments through optimized path-planning algorithms.
- Pioneered a dual-layered architecture integrating **reinforcement learning** for path planning and **YOLOv8 Nano** for real-time object detection, improving obstacle avoidance accuracy by **22%**.
- Enhanced swarm responsiveness by **20%** via centralized communication using **MongoDB**, enabling efficient coordination among 10+ robots by conducting **50+ simulation runs** in the **Gazebo** environment with TurtleBot Burger.

### Undergraduate Researcher, IIT Jodhpur | Semantic Bridge: Dual-Hybrid Knowledge Graph

Ongoing

- Analyzed limitations of existing on-demand fusion frameworks, identifying up to **40% semantic loss** and **hub explosion** in knowledge graph line-graph conversions.
- Proposed a novel **dual-hybrid graph representation** that preserves **100% semantic fidelity** by linking the original knowledge graph with its line graph via a lossless mapping.
- Designed a **hub-aware selective conversion strategy** projected to reduce clique blowup by **30–40%**, improving query efficiency while maintaining semantic preservation.

## PROJECTS

### Project Raseed | AI-First Receipt Intelligence Engine with Google Wallet Integration | GitHub

Jul 2025 – Present

- Architected a scalable **GCP** serverless backend (Cloud Functions, Firebase) with **Gemini AI**, achieving a **60% reduction** in multimodal receipt processing latency.
- Enabled local-language queries via **Vertex AI Agent**, returning real-time insights as interactive **Wallet passes** (e.g., spending trends, shopping lists, savings alerts) projected to increase user engagement by over 90%.
- Engineered a **Gemini Vision** ingestion pipeline with **98% OCR** accuracy.
- Tech Stack: **Gemini Pro Vision, Vertex AI, Google Wallet API, Firebase, Cloud Functions.**

### E-commerce Platform | MERN Stack | GitHub

May 2025 – Present

- Architected a responsive e-commerce web application using the **MERN stack**, enabling seamless **user authentication**, real-time **product management**, and **secure transactions**.
- Crafted a **mobile-first** e-commerce website using **Tailwind CSS**, ensuring a responsive user interface across devices and cutting page load times by **2 seconds**, improving user engagement by **30%**.
- Technologies Used: **MongoDB, Express.js, React, Node.js, JWT, Redux, Tailwind CSS, Razorpay.**

### SentimentSphere | Multimodal Emotion Recognition | GitHub

Jun 2025 – Jul 2025

- Designed and deployed a real-time facial emotion detector (CNN, 68% validation accuracy), delivering 50ms response latency for live video analysis.
- Developed and trained a BiLSTM text classifier (65% validation accuracy), integrating GloVe-200D embeddings for robust multimodal emotion predictions.
- Unified visual and text analytics on a streamlined Python web platform, improving end-user detection accuracy by 20% over single-modality systems.
- Tech Stack: **Python, TensorFlow, OpenCV, NLP, GloVe, BiLSTM.**

- Built a machine learning-based NIDS to identify malicious network activities such as DoS attacks and unauthorized access with **90%+ detection accuracy**.
- Engineered features and preprocessed KDD Cup 99 and NSL-KDD datasets; applied ML models (k-NN, SVM, ANN, RF, XGBoost), improving intrusion detection with AUC scores above 0.90.
- Technologies Used: **Python, TensorFlow, scikit-learn, XGBoost, NumPy, Pandas.**

KEY COURSES TAKEN

Data Structures Algorithms, Pattern Recognition and Machine Learning, Probability, Statistics Stochastic Processes, Signals and Systems, Circuit Theory, Computer Organization Architecture.

TECHNICAL SKILLS

**Programming Languages:** C/C++ , Python, JavaScript, SQL  
**Libraries/Frameworks:** NumPy, Pandas, Matplotlib, OpenCV, Scikit-Learn, Gazebo  
**Tools OS:** Git, Jupyter Notebook, Google Colab, Linux, Windows  
**Software:** Gazebo, SolidWorks, Fusion 360, Vivado

POSITIONS OF RESPONSIBILITY

<b>Coordinator</b> , Robotics Society, IIT Jodhpur	<i>Aug 2025 – Present</i>
<b>Design Coordinator</b> , Career Development Cell, IIT Jodhpur	<i>Jul 2025 – Present</i>
<b>Associate</b> , Product Club, IIT Jodhpur	<i>Aug 2024 – Apr 2025</i>
<b>Joint Secretary</b> , Fine Arts Society, Board of Art and Culture, IIT Jodhpur	<i>Aug 2024 – Apr 2025</i>

ACHIEVEMENTS

Achieved a <b>Top 5</b> position at Inter IIT Tech Meet 13.0, Autonomous Swarm Navigation	<i>2024</i>
Clinched <b>1st Place</b> at Pitch Rush: Product Management Hackathon, The Product Club, IIT Jodhpur	<i>2024</i>
Qualified for the <b>finals</b> of the RowBoatics RC Boat Racing competition at Techfest, IIT Bombay	<i>2023</i>
Secured <b>AIR-393</b> and <b>AIR-121</b> in the JEE Mains B.Arch and B.Planning examinations	<i>2019</i>