GALABA VAMSI

Software, AI/ML Research & Robotics

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SUMMARY

Results-driven Mechatronics undergraduate at **IIT Bhilai** bridging **Machine Learning, Robotics (ROS2/Isaac Sim), and Software Engineering**. Proven track record in developing complex end-to-end systems, from AI-driven Wi-Fi simulation (Inter IIT 5th Rank) and GNN-based protein modeling to **open-source** 6G RIS emulators. Experienced in full-stack development, Safe Reinforcement Learning, and physics-based simulations. Seeking research and software engineering roles in AI/ML, autonomous systems, and advanced robotics.

EXPERIENCE

Research Intern – 6G RIS Simulator & Testbed Development May 2025 – Aug 2025
IIT Bhilai

- Engineered a **zero-budget**, **open-source** RIS simulator emulating USRPs in LoS/NLoS environments, **saving lakhs of rupees** in physical hardware scaling and pre-deployment testbed costs.
- Published as **First-Author** and **Co-Author** (IEEE INDICON 2025) for novel Smart Radio Environments (SRE).
- Designed and validated a custom two-layer RIS PCB using DipTrace/CST for self-powered RF energy harvesting.

Team Lead – Arista High-Prep Problem Statement (5th Rank) Dec 2025
Inter IIT Tech Meet 14.0

- Architected a **zero-budget** Python Wi-Fi simulator and AI-assisted Radio Resource Management (RRM) framework, bypassing ns-3 constraints to deliver a **+15% throughput improvement**.
- Engineered a multi-timescale pipeline using 802.11k/v telemetry, **Dual-CNNs**, and **Graph Neural Networks (GNNs)**, achieving a **<2% false positive rate** in complex interference detection.
- Deployed **Bayesian Optimization** and **Safe Reinforcement Learning** to dynamically tune channel and OBSS-PD parameters, guaranteeing **100% DFS regulatory compliance**.

KEY PROJECTS & RESEARCH

AI-Powered Electron Interaction in Protein Structures 2025 – Present

- Designing Graph Neural Network (GNN) architectures to model complex electron interactions within protein structures, bridging deep learning and computational quantum chemistry.

Amazon ML Challenge – Top 3.5% (700 / 20,000+) 2025

- Led multimodal price prediction utilizing **Qwen 2-VL 7B** and a two-tower (ViT + RoBERTa) architecture over 75,000 data pairs, achieving an **SMAPE score of 49.0**.

Shared-Action Autonomous Smart Wheelchair 2025

- Developed a shared-control system integrating multiple stimulus inputs and joystick navigation with deep learning-based real-time signal processing; validated dynamics in **Isaac Sim** and **MuJoCo**.

Serenity Mental Health App 2024

- Developed an **open-source**, **Flutter**-based mental wellness app integrating CV-based real-time emotion detection, stress-revealing games, guided exercises, research-backed assessment quizzes, and a doctor appointment booking system.

EDUCATION

B.Tech., Mechatronics 2023–2027
Indian Institute of Technology Bhilai

Coursework: Deep Learning for Computer Vision (DLCV), AI & Machine Learning, Digital Image Processing (DIP), Optimal Control, Control Systems, Data Structures & Algorithms, Robotics Systems.

SKILLS

Languages
Python, C/C++, JavaScript, Dart, Go

AI & Machine Learning
PyTorch, Graph Neural Networks (GNN), Safe RL, Transformers (Qwen, ViT, RoBERTa)

Robotics & Simulation
ROS2, NVIDIA Isaac Sim, MuJoCo, Custom Python Simulators, PLC, Drone Dev.

Systems & Networks
Wi-Fi PHY/MAC Modeling, IEEE 802.11k/v, SDR/USRP, Linux, Git

Web & App
React.js, Node.js, Three.js, WebGL, Flutter, Flask

Hardware & Design
DipTrace, SolidWorks, CST Microwave Studio, PCB Design

PUBLICATIONS

First-Author, *"An Open Emulator for Smart Radio Environments"*.

Co-Author, *"Experience with RF Energy Harvesting-Driven Self-Powered RIS"*, IEEE INDICON 2025.

ACHIEVEMENTS

5th Rank, Arista Networks Wi-Fi Optimization Challenge, Inter IIT Tech Meet 14.0.

Top 3.5%, Amazon ML Challenge 2025.

Top 10 Finalist, Toyota Hackathon.