GITARTHA GOGOI

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SUMMARY

Signal Processing Engineer skilled in DSP algorithms, advanced communication system, wireless system modelling, and embedded signal processing. Experienced in IRS/MU-MISO simulations, IoT data pipelines, and MATLAB/Python/C++ based algorithm development. Strong analytical ability with proven improvements in performance, latency, and system reliability.

EDUCATION

MTech – Digital Communication & Signal Processing, Sikkim Manipal Institute of Technology *(2024–Present)*
CGPA: 8.6
BTech – Electronics & Communication Engineering, Assam University *(2020–2024)*
CGPA: 7.6

EXPERIENCE

Team Lead – Eminence Robotics (2022–2023)

- Built competition-grade robots using ESP32, motor drivers, sensors, and wireless control, improving actuator speed through optimized signal processing.
- Led debugging, rapid prototyping, and stress-testing efforts, improving robot stability and reaction time, winning NERIST, GIMT, and AEC Techfests.

IoT System Intern – MeOWL Technologies (2021–2022)

- Developed multi-node IoT acquisition systems using ESP32, Raspberry Pi CM4, GSM, and LoRa, implementing optimized RF communication and signal-processing workflows to enhance reliability and real-time performance.
- Identified and resolved power-failure resets by integrating a UPS failover module, preventing data loss and enabling safe shutdown.

PROJECTS

Active IRS-Aided MU-MISO downlink wireless system (MATLAB)

- Modelled Active IRS-assisted MU-MISO wireless systems in MATLAB, implementing AO-based practical phase-shift optimization, WMMSE precoding, and link-level performance analysis (SE, SNR, energy efficiency, and total transmit power).
- Achieved a measurable performance gain of ~22% compared to passive IRS setups by optimizing IRS amplification, improving signal reflection efficiency, and reducing effective channel distortion.

Smart Energy Meter (IoT + Signal Processing)

- Designed a high-frequency PZEM-based sensing module and applied signal-processing techniques (oversampling, noise filtering, and moving-average smoothing) to reduce measurement noise and significantly improve accuracy and stability.
- Developed a multi-node IoT mesh network using ESP32 and LoRa/GSM, enabling network-independent operation and enhancing system reliability for real-time monitoring and energy-data transmission.

SKILLS

DSP: FFT/IFFT, Filtering, OFDM, Beamforming, Channel Estimation
Programming: MATLAB, Simulink, Python, C, C++, Embedded C
Wireless: MIMO, MU-MISO, IRS, LoRa, BLE, WiFi, GSM
Embedded: ESP32, ESP8266, Raspberry Pi, I2C, SPI, UART
Hardware/HDL: Verilog, VHDL, PCB Debugging.

PUBLICATIONS

- *Gogoi, G. et al., "Performance Analysis of Active IRS-Assisted MU-MISO System," International Journal of Information Technology, 2025.*
- Gogoi, G., "Smart Energy Meter for Accurate Real-Time Monitoring," *ICIMSTAS 2023*, USTM Meghalaya.

EXTRACURRICULAR

- World Robot Olympiad (WRO) National-Level Competitor – 2016 & 2017.