Samir Bhattarai

601-297-7099 Hattiesburg, MS 39401
samirbhattarai135@gmail.com linkedin.com/in/samir135 github.com/samirbhattarai135 samirbhattarai.com

Education

University of Southern Mississippi **Aug 2023 – May 2027**
Bachelor of Science in Computer Engineering *Hattiesburg, Mississippi*
Relevant Coursework: Data Structures & Algorithms, Digital Electronics, Embedded Systems Design, Robotics
Honors & Awards: President's List Scholar(All semesters), Academic Excellence Award

Technical Skills

Languages: Python, C++, VHDL, System Verilog, MATLAB, SQL, HTML/CSS, JavaScript
Developer Tools: VS Code, Vivado, Ignition, Fusion 360, Gazebo, Rviz, MATLAB, Google Cloud Platform, AWS
Technologies/Frameworks: ROS2, Tensorflow, Linux, GitHub, OpenCV, Keras, Matplotlib, Django, FastAPI
Certifications: Modern Robotics (Northwestern University), Integrated CAD/CAM/CAE (Autodesk), Data Analysis

Experience

University of Southern Mississippi **Aug 2024 – Present**
Undergraduate Research Assistant *Hattiesburg, Mississippi*

- Simulated Field-Programmable Gate Array (FPGA)-based authentication schemes for drones using Chebyshev polynomials, generating **800 keys** in **1.2169ms** with **25.0KB** overhead
- Implemented the authentication scheme on the FPGA board using **AMD Vivado** and **VHSIC Hardware Description Language (VHDL)**, utilizing **20.9% LUTs** and **8.7%** of Flip-Flops with a Latency of **10ms**
- Presented research findings to academic and industry professionals, through a technical paper at the **2025 Undergraduate Symposium on Research and Creative Activity (UGS)** at University of Southern Mississippi

Shree Indrenee Vidya Mandir **Apr 2023 – Jul 2023**
Embedded Systems Intern *Panchkhal, Nepal*

- Designed an embedded system for real-time Bluetooth audio streaming and MP3 file downloads, leveraging **ESP32** board's local web server and **OpenAI's Text-to-Speech API**
- Optimized system performance for audio streaming and downloads by integrating **Serial Peripheral Interface Flash File System (SPIFFS)** for efficient storage, **Wifi** for robust connectivity, and secure API communication

Projects

Smart Home SCADA System | *Ignition 8.1, ESP32, MQTT, Node-Red, TCP/IP, IoT, sensors* **Jun 2025**

- Developed a **SCADA-based smart home system** by integrating **Ignition 8.1, MQTT**, and **Node-RED** for seamless data acquisition from **ESP32** connected to various sensors enabling centralized control and real-time home monitoring
- Created a web-based dashboard using **Ignition Perspective Designer** to monitor and visualize **10+ real-time data points** across **3 primary rooms**, enabling remote management of **10+ individual devices**

Vision Bot | *Python, C++, Esp32 Cam Module, Fusion 360, ROS2, SLAM, YOLOv9, Gazebo, RVIZ* **Aug 2024**

- Developed vision-enabled autonomous robot integrating **ESP32 Cam** with **YOLOv9** for real-time object detection and self-navigation
- Implemented **Python**-based navigation algorithms within a **Robot Operating System(ROS)** framework, using **Simultaneous Localization and Mapping (SLAM)**, achieving **88%** route efficiency and **93%** collision reduction

Leadership / Extracurricular

USM ACM-IEEE Robotics Club **Sep 2023 – Present**
Member *University of Southern Mississippi*

- Engineered the robot for navigation, cargo pickup, and sorting mechanisms using **Autodesk Fusion 360, ROS, and Gazebo** for the SoutheastCon 2025 hardware competition
- Taught **robotics, coding, and 3D design/printing** to 3rd-12th graders in Eagle Maker Hub Summer Camps resulting in students' deeper understanding of robotics, and coding demonstrated by **students' self-made robots**

CCRC Scientific Circle **Aug 2019 – Jul 2021**
President *Capital College and Research Center*

- Tested stationary and sun-tracking solar panel project (with/without wipers for automatic cleaning), demonstrating a **20-25%** efficiency increase in **sun-tracking panels with wipers**
- Engineered a Battle Bot using **Arduino ATmega 328 and a 433 MHz RF module** for responsive navigation and optimized performance
- **Winner of LOCUS 2020**, 17th National Technological Festival for Sun-Tracking Solar Panel project, and **1st runner-up** in Kathmandu University Annual Robotics Festival for Battle Bot