SAMIR BHATTARAI

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EDUCATION

University of Southern Mississippi **Aug 2023 - May 2027**
Bachelor's, Computer Engineering *GPA: 4*

CERTIFICATIONS

Modern Robotics: Mechanics, Planning, and Control - Northwestern University/Coursera
Integrated CAD/CAM/CAE - Autodesk / Coursera
Scientific Computing & Data Analysis with Python

TECHNICAL SKILLS

- **Tech Stacks:** Python, C++, MATLAB, VHDL, Verilog, JavaScript, HTML/CSS, Autodek Fusion 360, MATLAB/Simulink, ROS, Vivado, Vitis HSL, AWS, MongoDB, MySQL, Docker, Git, Gazebo, Computer Vision, Tensorflow, Django, Node.js, Next.js, React.js, Google Cloud Platform, Microsoft Azure
- **Relevant Courses:** Data Structures & Algorithms, Digital Logic, Software Development, Modern Robotics, Embedded Systems Design, Linear Signal Analysis, Digital Electronics, Analog Circuits
- **Languages:** Hindi, Nepali, English

WORK EXPERIENCE

University of Southern Mississippi
Research Assistant *Aug 2024 - Present*
- Simulated key-based authentication schemes using Chebyshev and Hénon maps to evaluate computation and communication overheads.
- Implemented authentication protocols on FPGA boards (Xilinx Vivado) using VHDL/System Verilog, integrating UART for secure drone-ground station communication.
- Developing a robot with real-time object detection using a Raspberry Pi camera and YOLOv9
- Designed advanced avoidance algorithms, achieving 88% route efficiency and 93% collision reduction
- Applied ROS for path planning, obstacle avoidance, and localization to ensure precise movements

Infolaya
Software Developer *Feb 2025 - Apr 2025*
- Developed a full-stack web app enabling non-technical users to upload CSV, XLSX, JSON, or TXT files for automated visualizations and predictions
- Built a FastAPI backend with OpenAI integration to generate Python visualization code and frontend UI using Next.js and Tailwind CSS
- Deployed backend on AWS EC2 and frontend on Vercel to ensure high availability and scalable performance

Shree Indrenee Vidya Mandir
Embedded Systems Intern *Apr 2023 - Aug 2024*
- Designed a system for real-time Bluetooth audio streaming and MP3 file downloads via a local web server, using OpenAI's TTS API
- Utilized SPIFFS for storage, WiFi for connectivity, and API communication for file streaming and downloads
- Engineered a CNC printer with a precise pen mechanism for printing 2D text and images across X-Y axis.
- Coded an Arduino-based system to process and print digital inputs onto paper using stepper motors.

EXTRACURRICULAR EXPERIENCE

ACM - IEEE USM Club **Hattiesburg, MS, USA**
Project Leader *Aug 2023 - Present*
- Leading prototype design for locomotion, cargo pickup, and sorting mechanisms using Autodesk Fusion 360, ROS, and Gazebo for the 2025 competition.
- Built hardware and developed 30% of the code for locomotion and servo mechanism for the flag display in the 2024 competition.

CCRC Scientific Circle *Jul 2019 - Aug 2021*
President
- Tested stationary and sun-tracking solar panel setups (with/without wipers), demonstrating a 20-25% efficiency increase in sun-tracking systems with wipers
- Engineered a Battle Bot using Arduino ATmega 328 and a 433 MHz RF module for responsive navigation and optimized performance.

HONORS & AWARDS

- Presidents List Scholar: Fall 2023, Spring 2024, Fall 2024 – University of Southern Mississippi
- Academic Excellence Award, Full Tuition Scholarship – University of Southern Mississippi
- Winner - LOCUS 2020, 17th National Technological Festival SDG 7 Category – Sun-Tracking Solar Panel project
- 1st runner-up – Kathmandu University, Annual Robotics Festival – Battle Bot