

Siddhant Chaurasia

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EDUCATION

Binghamton University, State University of New York

Master of Science in Electrical and Computer Engineering

May 2024

CGPA: 3.90/4.00

Manipal University Jaipur

Bachelor of Science in Electronics and Communications Engineering

May 2022

CGPA: 7.29/10.00

Relevant Coursework: Digital Signal Processing, Computational Tools, Neural Networks & Deep Learning, Mathematical Methods in EE, Bio-Imaging, Implantable Bioelectronic Devices, Human-Organ-On-A-Chip, Data Structures and Algorithms Using C++, Computer Organization & Architecture, Embedded & Real Time Operating Systems

TECHNICAL SKILLS

Programming Languages: C, C++, Python, MATLAB, R, Verilog, Assembly, JavaScript.

Frameworks & Libraries: PyTorch, TensorFlow, scikit-learn, FreeRTOS, Embedded Linux, Hadoop.

Design & Development: Circuit Design, PCB Design, DSP Algorithms, Hardware Interfaces.

Tools & Instrumentation: SPICE, Ansys HFSS, AutoCAD Electrical, MATLAB/Simulink, Xilinx Vivado, Oscilloscopes, Network Analyzers, JTAG, Altium Designer.

Proficiencies: Real-Time Systems, Embedded Systems, Machine Learning, EE Mathematics, Signal Processing.

LICENSES & CERTIFICATIONS

edX Verified Certificate for Embedded Systems Essentials with Arm: Getting Started

Nov 2024

Credential ID: 8b32583490ac4ef48a31d1a22bea4308

- **Skills:** Embedded Systems, Embedded Software Programming, C++, Embedded C, ARM Cortex-M, ARM Architecture, Mbed

PROFESSIONAL EXPERIENCE

Research Assistant

July 2024 - Present

Binghamton University | Python, ML, Image Processing, Security Testing

Binghamton, NY

- Engineered image byte manipulation techniques in Python that successfully bypassed C2PA's cryptographic checks.
- Identified a critical date-handling vulnerability and currently leveraging machine learning techniques for further exploitation

Machine Learning Research Intern

May 2022 - Nov 2022

IOTA Informatics Pvt Ltd | Python, PyTorch, Neural Network

Bhopal, India

- Designed a CNN model using PyTorch to accurately recognize handwritten characters in doctors' notes.
- Increased recognition precision to 91% by applying OCR-specific preprocessing techniques and optimizing the model through cross-validation.

Project Trainee (Internship)

Jan 2022 - May 2022

Indian Space Research Organization | Microwave Engineering, Ansys HFSS

Ahmedabad, India

- Modeled and simulated a square coaxial 4-way power divider for a 2 GHz phased array antenna using Ansys HFSS.
- Achieved equal signal split and precise quadrature phase differences across output ports, enabling efficient circular polarization for the antenna.

PROJECTS

FPGA-Based Matrix Multiplier for AI Acceleration | Verilog, Vivado, Embedded Systems

- Built and fine-tuned a 4x4 matrix multiplier on a Basys 3 FPGA for AI workloads, achieving real-time performance through UART-based input/output.
- Reduced computation latency and optimized FPGA resource usage, successfully synthesizing and simulating the design in Vivado.

DFT Application in Jamming Signal Detection | MATLAB, Signal Processing, DFT, Bandpass Sampling

- Developed a DFT-based technique in MATLAB to isolate target signals from jamming interference.
- Enhanced signal-to-noise ratio by up to 40 dB through precise spectral analysis and windowing methods, while bandpass sampling was employed to prevent aliasing during scenario simulations.

AI vs. Human Text Classifier | Python, PyTorch, NLP, Transformer Models

- Built a transformer-based NLP model in PyTorch, achieving 95% accuracy in distinguishing AI-generated from human-written text.
- Enhanced performance by leveraging BERT tokenization and fine-tuning hyper-parameters through grid search.

Real-Time DSP for Noise Suppression | C++, MATLAB, DSP, Embedded

- Designed and implemented a noise suppression algorithm using adaptive filtering (LMS) on an ESP32 microcontroller, reducing background noise in voice recordings by 10-15 dB.
- Validated performance through MATLAB simulations and real-time testing, demonstrating improved voice clarity.