

Fabio D. Salgado

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Objective

Computer Engineering student at Georgia Tech seeking a full-time engineering position focused on embedded systems, digital signal processing, and computer architecture. Brings hands-on experience developing real-time hardware/software systems, DSP applications, and networked embedded platforms using C/C++, microcontrollers, Raspberry Pi, and FPGA technologies.

Education

Georgia Institute of Technology | Atlanta, GA

August 2024 – Present

Bachelor of Science in Computer Engineering, Overall GPA 3.50 / Major GPA 3.60

Expected Graduation, May 2027

Berry College | Rome, GA

January 2021 – May 2024

Bachelor of Science in Dual Degree Engineering program transfer with 94 Credit Hours, Overall GPA 3.73 / Major GPA 3.82

Expected Graduation, May 2027

Skills

Programming: Java, C, C++, MATLAB, Racket, RISC-V assembly, VHDL (FPGA)

Hardware: Raspberry Pi, ARM Cortex microcontroller, ESP32 microcontroller, FPGA, Oscilloscope, Logic analyzer

Software: AutoCAD, Quartus, Autodesk Revit, LaTeX, EJS tools, Q-SYS Designer (level 1 certified), Docker, Unity Engine, GStreamer, OpenCV, FreeRTOS, Flask, Embedded Linux, Git

Communication: Design Proposals, Technical Reports, Presentations (large and small audiences), simple schematics

Languages: English (fluent), Afrikaans (beginner)

Experience

NetPlanner Systems | Peachtree Corners, Georgia

June 2026 – July 2026

AV lab programmer / Technician (12hours/week)

Technology Systems Integrator.

- Programmed AV control systems in Q-SYS Designer, developing control logic and signal flows for integrated audio and visual environments.
- Designed and implemented Q-SYS user interfaces for intuitive control of AV peripherals and system functions.
- Built and configured AV rack systems for testing and commissioning, wiring equipment and verifying signal paths and system functionality.
- Troubleshoot audio, video, and network-connected AV equipment, retrieving network device information to assist with system configuration and diagnostics.

Berry College IT Students (BITS) | Rome, Georgia

August 2021 – May 2024

PC Technician / PC Deployment and Support (12hours/week)

- Imaged or deployed 150+ faculty and staff PCs worth over \$50,000, ensuring a seamless transition with no downtime.
- Arranged PC deployment times with a team of 4 and coordinated with 20+ departments concerning their PC needs, ensuring on demand support.
- Transferred data and replaced PCs in more than 8 campus buildings, allowing professors and lab students access to suitable technology.
- 3 years of frontline troubleshooting for software, hardware and user related issues amongst users on campus, enhancing system reliability.

City Café and Bakery | Fayetteville, Georgia

May 2021 – June 2024 (summers)

Retail worker, Dishwasher

Dine-in restaurant and wholesale bakery.

- Handled customer interactions, managed retail requests and simplified order processes, contributing to a smoother workflow.
- Cooperated with dishwashers, servers, bakers and chefs to ensure the steady rotation of kitchen and bakery equipment and utensils.

- Articulated customer needs with waiters, hostesses, and chefs to ensure the desired product was produced.

Projects

RacMan

Spring 2024

Partner / Designing Programs: Problem-Solving and Abstraction

Worked with a partner from the ground up to create a working program of the game Pacman implementing the Racket language.

- Applied the fundamentals of abstraction and recursion to greatly shorten the length of the source code, improving readability and conciseness.
- Utilized an algorithm that allowed ghosts to “seek” Pacman more effectively, making a more accurate and challenging game.
- Scheduled dedicated work periods with a partner to effectively and cooperatively solve coding problems.

Snake

Spring 2025

Student / Programming Hardware and Software Systems

- Built a Snake game using C++ and an ARM Cortex microcontroller, integrating hardware peripherals for user controls.
- Programmed data structures and game conditions enabling multiple difficulty levels.
- Added custom game assets (e.g., unique fruits with varying effects), enhancing gameplay variety.

DE 10 Board LED peripheral

Spring 2025

Team member / Digital Design

- Designed a custom LED brightness peripheral for the DE10 FPGA board using VHDL and Quartus.
- Collaborated with a 5-person team to implement and test hardware functionality.
- Authored design proposals, a technical manual, and delivered a final presentation to communicate results to employer-facing audiences.

Controlling your Raspberry Pi Camera using the Web

Fall 2025

Student / Web Controlled Embedded Systems

Utilized a Raspberry pi 5 and camera module to create a live camera feed accessible for all users on the network.

- Combined a python program provided and OBS to create a livestream accessible from long distances.
- Applied 3D printing skills to produce an adjustable stand to better angle the lens.

ESP32 walkie talkies

Spring 2026

Student / Embedded Systems Design

- Designed and built a pair of ESP32-based walkie-talkies from the ground up, integrating an I²S digital microphone, I²S audio amplifier, OLED display, potentiometer, push-to-talk control, and navigation interface
- Leveraged the ESP32's dual-core architecture to isolate real-time audio processing and wireless communication from user-interface and device-control tasks using FreeRTOS.
- Implemented 16 kHz voice sampling and packetized audio transmission over ESP-NOW, using DMA buffers, a circular receive buffer, and RTOS synchronization to maintain continuous audio playback and half-duplex communication.
- Applied digital signal-processing techniques including DC blocking, low-pass filtering, dynamic-range compression, pre-gain, audio fading, and soft limiting to improve speech clarity and reduce distortion.
- Implemented direct peer-to-peer communication by configuring ESP-NOW peers using unique MAC addresses, enabling targeted transmission of real-time voice packets, delivery-status callbacks, and basic link-status detection across a 100-meter range.
- Created detailed pin-level wiring diagrams documenting component interconnections, power distribution, GPIO, I²S, I²C, and RF interfaces.

Raspberry PI Video over IP System

Summer 2026

Student / Signals and Systems

- Designed and implemented a Raspberry Pi-based video over IP system using a Pi 5 as the central DSP/core node and Pi 4 nodes as video sources and sinks, connected through Gigabit Ethernet/PoE.
- Built a real-time C++/GStreamer 720p video pipeline with OpenCV DSP, H.264 hardware encoding, RTP packetization, and UDP streaming while parallelizing pixel-level processing across CPU cores.
- Implemented configurable convolution-based DSP filters including sharpening, blurring, edge detection, and embossing, using integer kernels for reduced computational overhead and ARM-oriented optimization.
- Developed a Flask web UI and C++ socket interface for remotely controlling DSP parameters, integrating embedded Linux, networking, real-time video processing, and system control into an end-to-end platform.

Open-Channel Sensing & Impulse Noise Filtering

Spring 2026

Partner / Applications of Digital Signal Processing

- Designed and implemented a MATLAB communication-system simulation to evaluate open-channel detection and impulse-noise filtering techniques under varying channel counts and noise conditions.
- Implemented and compared four channel-sensing algorithms—mean-squared energy (MSE), adaptive thresholding, Welch power spectral density (PSD), and autocorrelation—using ROC/AUC analysis and execution-time measurements.
- Developed four receiver-side DSP filters—adaptive LMS, Hampel/median, wavelet denoising, and amplitude clipping—to detect and suppress impulsive interference while preserving speech fidelity.
- Performed Monte Carlo analysis across 10–500 channels and –5 to 30 dB noise levels, demonstrating the tradeoff between detection accuracy and computational complexity; Welch PSD provided the strongest detection performance at intermediate noise levels.
- Achieved 30–65 dB post-filtering SNR using targeted median and adaptive LMS filtering for high-amplitude impulsive noise, substantially outperforming clipping and wavelet-based approaches.

Relevant Coursework

Digital System Design Lab

Spring 2025

Conception, design, fabrication, and testing of digital hardware in a hands-on setting; schematic capture, logic simulation, and VHDL-based logic synthesis on FPGAs.

Programming Hardware and Software Systems

Spring 2025

High Level Language and Assembly Programming; Software performance & reliability, Supporting Data and procedural Abstraction, Heap Management, embedded systems.

Arch, Systems, Concurrency & Energy in Computation

Summer 2025

5-stage pipelined model utilization, cache memory systems, virtual memory systems, concurrency paradigms, energy and power consumption in computer systems.

Fundamentals of Digital Signal Processing

Spring 2026

Sampling theorem, discrete-time Fourier transform. Power spectrum, discrete Fourier transform and the FFT algorithm, Z-transform, digital filter design and implementation.

Applications of Digital Signal Processing

Spring 2026

Applications of DSP in speech, image processing, radar, pattern recognition, and adaptive filtering requiring working software implementations applied to the analysis of real signals.

Embedded Systems Design

Spring 2026

Processors, chipsets, buses, and I/O devices for high-end embedded systems. Embedded operating systems; device drivers and applications for embedded systems.

Signals and Systems

Summer 2026

Continuous-time linear systems and signals, their mathematical representations, and computational tools. Fourier and Laplace transforms, convolutions, input-output responses, stability.

VLSI & Advanced Digital Design

Fall 2026

Advanced digital design issues in the context of VLSI systems. Introduction to a design methodology that encompasses the range from architectural models to circuit simulation.

Adv Computer Architecture

Fall 2026

Comprehensive coverage of the architecture and system issues that confront the design of high-performance workstation/PC computer architectures with emphasis on quantitative evaluation

For more information on other projects and myself, please visit my personal website portfolio:

<https://fabiosalgado01.wixsite.com/portfolio>