ANDRÉS RAGOT

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LinkedIn | GitHub | GitLab

EXPERIENCE

ORBIS **Feb 2025 - Present**

- **Redesigned the firmware architecture of a legacy ESP32 product line** after flash, RAM, and stability limitations became a bottleneck for delivering customer-facing features.
- **Engineered a more robust asynchronous event system**, reducing deadlock-prone behavior and improving runtime stability in deployed devices.
- **Built a PSRAM-oriented memory strategy** that moved task stacks and large buffers out of internal SRAM, enabling richer feature sets on constrained hardware.
- **Applied modern C++ techniques**, including RAII, standard ownership models, and modular hardware abstractions, to reduce fragile legacy code and improve long-term platform robustness.
- **Made firmware architecture decisions with direct product impact**, improving reliability, deployment confidence, and maintenance outcomes for connected infrastructure systems.

SingularThings | **Tierra Audio** **Nov 2023 - Feb 2025**

- **Took ownership of firmware architecture and implementation decisions early on**, driving priorities based on system constraints, deployment risk, and customer-facing product requirements.
- **Translated customer requirements into practical firmware decisions**, balancing technical feasibility, implementation effort, reliability, and end-user impact.
- **Engineered a Wi-Fi mesh communication system** on ESP-MDF from the ground up, with focus on smooth discovery, robust reconnection behavior, synchronization, and error recovery to support reliable field operation.
- **Implemented low-level drivers and hardware interfaces** directly from datasheets across I2C, SPI, UART, ADC, and GPIO for temperature, proximity, audio, motion, and environmental sensing systems.
- **Integrated communication systems** across Wi-Fi, GSM, LoRa, Zigbee, and Bluetooth, selecting and adapting technologies based on range, responsiveness, resilience, and deployment constraints.
- **Mentored and coordinated interns** through onboarding, technical reviews, task planning, and knowledge transfer while remaining hands-on in development and debugging.

VirtualZone **Jun 2022 - Feb 2024**

- Contributed to **Unity-based real-time software for free-roam VR experiences**, with focus on hardware-integrated interaction systems and immersive gameplay.
- **Implemented hand-interaction behaviors using SteamVR/Valve controllers with HTC Vive hardware**, leveraging sensor input to improve realism and responsiveness in object manipulation.

PERSONAL PROJECTS

Lightweight 3D Graphics Engine for Microcontrollers

- **Architected and implemented a real-time 3D graphics engine in C++ for ESP32-class devices**, bringing a full software-rendered pipeline to hardware typically considered too constrained for this type of workload.
- **Optimized the engine around embedded constraints** such as memory footprint, execution cost, and display integration, enabling practical deployment on ESP32-P4 and ESP32-S3 while preserving portability to other MCUs and desktop systems.
- Designed the system as a **reusable cross-platform graphics foundation** rather than a board-specific demo, allowing faster iteration, broader hardware reuse, and lower adoption cost for future products.
- Created direct end-user value by **making advanced visual interfaces possible** on lower-cost embedded hardware, improving product experience without requiring a GPU-based platform.

Tailless - 3D Isometric Action Roguelike Videogame

- Served as the **sole programmer** for a production-ready 3D isometric action roguelike, owning the full gameplay and technical stack from core systems to runtime stability and feature delivery.
- Supported the project's progression into the **PlayStation Talents Spain incubation** process by delivering the technical execution needed for a strong public and industry-facing presentation.
- Designed systems with **direct player impact** in mind, focusing on responsive combat, runtime stability, and maintainable feature development to support a polished gameplay experience.
- Enabled the project to be showcased successfully at **multiple events across Spain**, where audience voting and external feedback validated the quality and appeal of the game.

EDUCATION

UDIT - Madrid, Spain 2021 - 2025

Bachelor's Degree in Design and Development of Videogames and Virtual Environments

- **Graduated first in class** in a multidisciplinary program centered on game development, virtual environments, and interactive technologies.
- **Developed a strong technical foundation** in real-time software, graphics, and user interaction, which later evolved into a parallel focus on embedded systems and hardware-aware development.
- **Selected to speak at graduation** in recognition of academic performance and involvement during the program.

INSA de Lyon - Lyon, France 2017 - 2021

Master's studies in Computer Science

- An **engineering-oriented curriculum** designed around software design, systems, project execution, and real-world applicability.
- **Gained strong technical maturity** through a demanding academic environment that emphasized rigor, structured problem solving, and engineering discipline.
- This experience played a major role in shaping my **systems-oriented mindset and deepening my interest** in technically demanding software development.

AWARDS & CERTIFICATIONS

Winner, Casa Valonia 2023 Hackathon

- An **international innovation event** focused on digital and creative industries. **Contributed to the development and presentation** of a prototype exploring the use of game and animation technologies in academic and cultural environments. Recognized for delivering an effective and innovative solution in a multidisciplinary competitive setting.

Learn Ethical Hacking From Scratch - Udemy

- Completed practical coursework in ethical hacking and cybersecurity, including Linux-based security tooling, network and wireless security fundamentals, vulnerability analysis, and defensive techniques. Built a stronger foundation in identifying security risks and understanding how systems can be better protected at the network and device levels.

SKILLS

- **Main Programming Languages:** C++, C.
- **Other Programming Languages:** C#, Java, SQL, JavaScript.
- **Embedded Systems:** FreeRTOS, ESP-IDF, ESP-MDF.
- **Graphic APIs:** OpenGL, Vulkan, LVGL
- **Tools:** Git, Visual Studio, Xcode, CMake, Unity, SteamVR.

ADDITIONAL INFORMATION

- **Languages:** Spanish (native), English (C1), French (B2)