Dennis Ray Filho

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Education

Florida Gulf Coast University — Fort Myers, FL

Bachelor of Science in Computer Science, Data Science Concentration — *Aug. 2023 – May 2027*

- **Capstone:** Developing a Unity-based VR app with Arthrex, extending the **OrthoVision** anatomical visualization platform.

Experience

Research Assistant — Aug. 2026 – Present

Florida Gulf Coast University, Human-Computer Interaction (HCI) Research — *Fort Myers, FL*

- Actively involved with research using AR glasses to create an avatar capable of communicating and interpreting sign language.
- Treasurer, IEEE FGCU Student Branch, which sponsored TechX Florida 2026 and provided student transportation
- Preparing an upcoming **full human-subjects study** to measure the VR cybersickness wearable's effectiveness

College Intern, Information Technology — May 2026 – Aug. 2026

NextEra Energy, Inc. — *United States*

- Analyzed enterprise data in Databricks across data lakes, lakehouses, OLTP, and OLAP systems
- Contributed to agentic AI systems that structured data and extracted actionable insights across business units
- Designed an EV charging reservation system: analyzed charger-usage data and interviewed EV drivers and product designers, traced idle time to drivers unaware charging had finished, and integrated the Smartcar API for live charge status
- Placed **3rd** in the company-wide "Win the Summer With AI" hackathon

Invention

VR Cybersickness Wearable (Jerk-Triggered Bone-Conducted Vibration) | *Python, PlatformIO, Swift* — Apr. 2026

- **Co-inventor on a university-funded patent:** named with Dr. Md Baharul Islam on FGCU's provisional patent; FGCU has committed full funding toward a utility patent
- First-author **IEEE ICIICE 2026** paper with Dr. Islam, doi.org/10.1109/ICIICE69672.2026.11565340; **FGCU AI Day** talk
- **Designed a novel headset-mounted clip** that holds a bone-conduction transducer firmly on the mastoid using the VR headset itself, with no headband or per-user calibration
- **Invented jerk-timed stimulation in VR** for cybersickness reduction grounded in vestibular (otolith) physiology, with vibration firing at peaks of linear jerk, the moments of strongest visual-vestibular conflict when cybersickness is most likely
- **Built a manufacturable, low-cost product:** designed a Python host app using OpenVR so it works with **any SteamVR app** unmodified, a custom PCB produced in a **10-unit run at $49.06/unit**, and ESP32-S3 firmware in PlatformIO; verified **0% packet loss over 1,000 BLE packets** and **158.8 ms** motion-to-onset latency with a custom Swift iOS app

Projects

OrthoVision | orthovision-seven.vercel.app | *TypeScript, React Three Fiber, Zustand, Python, MediaPipe* — Mar. 2026

- **1st Place Overall and Arthrex Challenge**, EagleHacks 2026; developed the project's **real-time hand-tracking, anatomical scene controls, and Speech-to-Text** interface.
- Built a Python hand-tracking sidecar (MediaPipe, OpenCV) streaming gestures over WebSockets at 30 FPS, with hysteresis debouncing, dead zones, and EMA smoothing to suppress false gestures
- Turned a 452-mesh anatomy model into selectable 3D structures in React Three Fiber: alias table resolving loader-mangled mesh names to typed IDs, Zustand state, per-frame material animation
- Added a GPT-4o-mini assistant whose structured JSON output drives the 3D scene (show, select, fly-to), with Web Speech API voice input and auto-reconnecting WebSocket client

Sleep Apnea Detection from ECG | *Python, XGBoost, scikit-learn* — Apr. 2026

- Built a leakage-free XGBoost pipeline on 70 PhysioNet ECG recordings (HRV features, GroupKFold); **0.70 AUC-ROC**

Pawthfinder | *Python, PyBullet, OpenStreetMap, A* Path Planning* — Sep. 2026

- Worked on the PyBullet simulation of a robot guide dog leading a blind pedestrian on real Miami streets: OpenStreetMap-built worlds with flood/hazard data, depth-camera height maps, and A* replanning every step

GridWatch | *Python, Google OR-Tools, NumPy, Dijkstra* — Oct. 2025

- **1st Place, NextEra Drone Optimization Challenge** (KnightHacks): built the OR-Tools vehicle-routing solver fitting pole waypoints into the fewest drone missions under a 37,725 ft battery cap, plus Dijkstra predecessor-matrix path expansion

Handwritio | *Flutter, Dart, Flask, Microsoft Azure OCR* — Feb. 2025

- **3rd Place**, EagleHacks 2025: built the Flutter frontend showing Azure OCR results of handwriting from a Flask backend

Technical Skills

Languages: Python, C, C++, TypeScript, JavaScript, Swift (iOS apps, AVAudioEngine/Core Audio), Dart
Frameworks & Libraries: React, React Three Fiber, Three.js, Zustand, Flutter, scikit-learn, XGBoost, pandas, NumPy, OpenCV, MediaPipe, Google OR-Tools, PyBullet, Unity
AI & Data: Multi-agent systems, Retrieval-Augmented Generation (RAG), agentic AI workflows, LLM structured outputs, Claude Code, Databricks, data lakes/lakehouses, OLTP/OLAP, RLHF, RLAIF, Benchmark-Driven Iterative Data Pruning
Embedded & Hardware: ESP32-S3, PlatformIO, JTAG, Bluetooth Low Energy (BLE), PCB design (EasyEDA, JLCPCB), SteamVR/OpenVR, 3D printing (TinkerCAD, Inkscape), Project Management; **Tools**: Git, Jira, Linux/Bash, Jupyter, Vite
Certifications, Licenses & Achievements: **CompTIA Secure Infrastructure Specialist (CSIS)**, Security+, Network+, A+; FCC Amateur Radio Technician License (KQ4TAL); 5x hackathon challenge wins
Spoken Languages: English (native), Portuguese (native), Spanish (professional working)