AMAL MADHU

M.Tech Scholar | Neuromorphic VLSI Researcher

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PROFESSIONAL SUMMARY

Aspiring Electronics Engineer with a research focus on **Neuromorphic VLSI**—bridging the gap between biological neural networks and hardware architecture. As a fresh postgraduate with a strong DIY ethos, I am passionate about mimicking brain functionality in electronics through analog/digital workflows. I bring a hands-on approach to problem-solving, having transitioned from broad ECE fundamentals to specialized AI-Hardware integration. Dedicated to research and innovation in mixed-signal design without prior corporate conditioning.

EDUCATION

M.Tech in Electronics Engineering (VLSI Specialization) **June 2025 – Present**
Digital University Kerala, School of Electronics & Automation (SoESA)
Focus: Neuromorphic Engineering, Quantum Physics Applications, AI Integration.

B.Tech in Electronics & Communication Engineering **2020 – 2024**
College of Engineering & Management, Punnapra CGPA: 6.66

RESEARCH & PROJECT EXPERIENCE

UNet Underwater Image Analysis (SIH Hackathon) *Ongoing Research*
Tech Stack: Python, PyTorch, AI/ML, Computer Vision

- Researching methods to enhance maritime security by clearing haze and turbidity in underwater imagery.
- Designing custom **UNet architectures** (Light/Attention variants) to mimic visual clarity processing.
- Utilizing personal datasets to train models, demonstrating self-driven data science capabilities.
- **Recognition:** Participation Award at Bengaluru Nagarrojuna College.

Accident Detection & Alerting System *B.Tech Capstone*
Tech Stack: IoT Sensors, Embedded C, Real-time Processing

- Engineered a DIY prototype for real-time vehicle monitoring and collision detection.
- Integrated hardware sensors to trigger automated emergency response alerts, minimizing latency.

Water Quality Monitoring System *B.Tech Project*
Tech Stack: Embedded Systems, Sensor Fusion

- Developed a portable sensor unit to analyze water parameters, focusing on low-power hardware integration.

TECHNICAL ARSENAL

- **Core Research Area:** Neuromorphic VLSI, Mixed-Signal Design, Bio-inspired Electronics.
- **Hardware Languages:** Verilog, SystemVerilog.
- **Industry Tools:** Cadence, Synopsys (Academic/Project exposure).
- **Programming:** Python (PyTorch focus), C/C++, Linux/Bash Scripting.
- **Productivity:** LaTeX (Scientific Documentation), Git, VSCode.

CERTIFICATIONS & ACHIEVEMENTS

- **Certifications:** NPTEL Cybersecurity · Python Web Dev (Angela Yu) · Linux (Imran Afzal).
- **Hackathons:** SIH Participation Award (Maritime Security).
- **Athletics:** 1st Place 1500m (Inter-school) · 3rd Place 1500m/Shotput (Intra-school).
- **Leadership:** Maths Club Leader (10th Standard).

INTERESTS

DIY Electronics (Prototyping Repair), **Neuromorphic Engineering** (Brain-Chip Interfaces), Quantum Physics, Sketching, Chess, Martial Arts.