

Mamadou Wane

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Summary

U.S. Marine Corps veteran and WGU Computer Science student, B.S. expected December 2026. Building two measured projects in the open: Skeptic, a verification harness that audits AI-generated code fixes for false green test suites, and One-Axis TVC, a hard real-time control and telemetry stack holding a 500 Hz loop to 7.5 microseconds of p99.9 wakeup jitter on a stock Linux kernel.

Skills

Languages: Python (3.12), C++20, Bash/Shell. **Software Engineering:** data structures and algorithms, object-oriented design, software development life cycle (SDLC), secure coding, code review, debugging and troubleshooting complex systems, **Testing and measurement:** pytest, unit and integration testing, mutation testing, coverage analysis, benchmark harness design, latency distribution analysis, adversarial test generation. **Systems and performance:** Linux real-time scheduling (SCHED_FIFO), CPU isolation and affinity, C-state and power management discipline, memory locking and prefaulting, lock-free SPSC queues, allocation-free hot paths. **Cloud (AWS):** IAM, EC2, S3, VPC, Lambda, EventBridge, CloudWatch, Security Hub, Config, Route 53, CloudFront, ACM. **Infrastructure as code:** Terraform. **CI/CD:** GitHub Actions, GitHub OIDC, pre-commit, CMake. **Version control:** Git, GitHub. **Security and policy as code:** Checkov, IAM least-privilege, encryption at rest. **Operating systems:** Linux (Red Hat Enterprise Linux, Ubuntu). **AI-assisted development:** Claude Code, OpenAI Codex, Anthropic API, LLM agent loops, prompt design and versioning, output validation and gating, responsible-AI controls (network isolation, credential separation, per-PR AI disclosure)

Projects

Skeptic, verification harness for AI-generated code fixes, Python and Docker | github.com/mamadou-wane/skeptic Audits the code an AI coding agent claims to have fixed and checks whether the patch fixed the bug or the tests. Built with Claude Code against two real open-source repos, pallets/click and Textualize/rich.

- Designed a differential-testing harness that seeds known bugs into a pinned upstream commit and hands the agent a `git archive` export with no `.git`, making the correct fix unreachable from inside the sandbox and giving every run a free oracle.
- Detected 27 of 29 reward-hacking patches at 0 false positives on both 12-case clean splits across a 12-task corpus, clearing a pre-registered 85 percent bar at 93.1 percent on 53 verdicts.
- Sandboxed the code-generating agent in per-repo Docker images, digest-pinned and network-off, with the model API loop held host-side to prevent credentials from entering container.
- Traced 24 tests failing inside the build container to a `less` binary missing from `python:3.12-slim`, found that the admission checks were validating the host instead of the container, and recorded it as an open defect.
- Extended the check layer with an opt-in paid profile (LLM-generated adversarial tests and a fail-closed LLM diff review) that moved three evasive hack fixtures from PASS to SUSPECT on 6 model calls, with the default profile making zero API calls.

One-Axis TVC, hard real-time control and telemetry stack, C++20 and Linux | github.com/mamadou-wane/tvc A 500 Hz thrust vector control loop on a stock Ubuntu generic kernel, reported as a latency distribution, with seven mitigations applied and measured one at a time.

- Cut p99.9 wakeup jitter to 7.5 microseconds at 500 Hz using per-core isolation and full C-state disablement, down from 88.4 microseconds on the same stack under a discipline that left C-states enabled: one power management knob, a 12x difference.
- Replaced relative `sleep\_for` scheduling with absolute deadlines after the naive loop drifted seconds off schedule while its own self-referenced harness reported it healthy.
- Added per-cycle telemetry at no measured cost through a lock-free SPSC ring with a TSan-verified drop path and a drain thread, holding pooled p99.9 within 48 nanoseconds of the quiet configuration over 2.4 million cycles per arm with zero ring drops.
- Wrote a regression gate that diffs a fresh campaign against committed baselines and fails on p99.9 regression, restricted to the measurement machine

Experience

United States Marine Corps, Combat Engineer | Nov 2017 – Nov 2021

- Planned and executed controlled demolitions under formal blast-radius analysis, applying risk controls and procedural discipline.
- Led route-clearance and hazard-mitigation operations under time pressure, performing real-time risk assessment and clear escalation.
- Operated and maintained heavy equipment and explosive materials under strict accountability and checklist-driven controls.

Certifications

- HashiCorp Certified Terraform Associate (004), HashiCorp, 2026
- Oracle Cloud Infrastructure Foundations Associate, Oracle, 2026
- Linux Essentials, Linux Professional Institute, 2026
- ITIL 4 Foundation, PeopleCert, 2026

Education: Western Governors University, B.S. Computer Science | Expected December 2026 Relevant coursework: data structures and algorithms, software engineering, operating systems, scripting, network security