

# Carter Perez

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## WORK EXPERIENCE

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### Cyber Skyline

*Software Engineer*

**May, 2025 – Present**

*Remote*

- Backend engineer for the CISA President's Cup CTF Competition, developed core competition systems including scoring engine, real-time notifications, support ticketing, and team/event management - #1 contributor with 70K+ lines.
- Engineered WebSocket notification system coordinating multi-instance Flask deployments via Redis pub/sub, implementing per-instance user session tracking to route messages across horizontally scaled containers without shared Socket.IO state
- Developed composable decorator middleware for authentication, resource loading, and error handling - standardizing security patterns and eliminating boilerplate across 60+ endpoints

### Sealing Technologies

*Integration Tech II*

**May, 2024 – May, 2025**

*Columbia, MD*

- Managed and optimized QA workflows for custom server builds, aligning with strict timelines and regulatory standards..
- Upgraded and maintained computer hardware across the facility, ensuring optimal performance and seamless integration with custom server builds.
- Played a key role in consulting on the assembly and logistics of \$40m worth of servers, network switches, and Cyber kits.
- Authored multiple blogs for the company website detailing efficient quality assurance processes for high-stakes assembly projects.
- Developed SOPs to standardize assembly procedures across teams and streamline onboarding.

### Jimmy Johns

*General Manager*

**Dec. 2022 – June, 2024**

*Severna Park, MD*

- Supervised 10+ staff members, optimizing task delegation and daily procedures for smooth restaurant operations.
- Diagnosed and repaired POS systems and networks across five stores, maintaining service reliability for the franchise.
- Optimized workflows and processes to eliminate excess labor costs and COGS, resulting in smoother operations.
- Reduced delivery times by 8 minutes weekly, securing recognition as the top-performing GM within a 5-store franchise.
- Created prep and cleaning checklists to improve back-of-house efficiency and accountability.

## CERTIFICATIONS

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CompTIA A+, Network+, Security+, CySA+, PenTest+, CASP+ | Python Institute PCEP

## EDUCATION

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**University of Maryland Global Campus**

*MS, Cyber Security*

**May, 2027**

*Largo, MD*

## SKILLS

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- **Technical Engineering & Development:** Splunk, AWS, Cloudflare, GCP, Docker, GitHub Actions, Linux, Python, Javascript, Typescript HTML, CSS, Shell, Regex, Scripting, Nginx, Apache, Git, Rust, C, Java, Swift, SolidJS, React, MongoDB, PostgreSQL, MySQL
- **Governance, Collaboration & Strategy:** Team building, Peer Mentoring, Certification Training, Customer Satisfaction, MITRE ATT&CK, ITIL, ISO 27001, COBIT, NIST 800-53, Cyber Kill Chains, CRM systems.

## PROJECTS

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- **Title:** [CertGames.com](https://certgames.com) | **iOS App:** <https://apps.apple.com/us/app/comptia-cert-games-practice/id6743811522>
- **GitHub:** [github.com/CarterPerez-dev/CertGames-Core](https://github.com/CarterPerez-dev/CertGames-Core)
- Developed full-stack cybersecurity learning platform and iOS app with 1000+ active users, featuring gamification engine with XP/achievements, real-time leaderboards, virtual shop economy, and 15,000+ practice questions
- Established comprehensive testing pyramid with 5,250+ automated tests across unit, integration, and E2E layers achieving 96% code coverage and preventing 95% of regressions through custom pytest fixtures and CI/CD integration
- Implemented multi-layered security system with pattern detection, behavioral tracking, request validation, JWT token/IP blocklisting, and automated threat intelligence reducing attack surface by 90%
- **Title:** SolidJS + Rust Performance Showcase | **Website:** [Rsolidjs.sh](https://rsolidjs.sh)
- Built high-performance Rust backend with Axum framework featuring parallel fractal computation engine (Rayon), GitHub API integration, real-time performance monitoring with WebSocket support, and comprehensive system metrics collection across CPU, memory, disk, and application-level KPIs
- Developed reactive SolidJS frontend with TypeScript showcasing real-time performance dashboards, interactive fractal visualization canvas, Web Vitals tracking, and live system monitoring with <16ms render times and fine-grained reactivity eliminating virtual DOM overhead
- **Title:** Full Stack Template | **GitHub:** [github.com/CarterPerez-dev/fullstack-template](https://github.com/CarterPerez-dev/fullstack-template)
- Built production-ready FastAPI + React boilerplate featuring JWT authentication with automatic token rotation, async PostgreSQL via SQLAlchemy 2.0, and end-to-end type safety with Zod runtime validation on frontend responses
- Engineered SafeEnum pattern storing enum values instead of names to prevent database breakage on refactors, timing-safe password verification preventing user enumeration attacks, and token family tracking that detects replay attacks by nuking entire token families on revoked token reuse
- **Title:** Semantic Media Searching | **Website:** <https://vuematics.com>
- Architected full-stack semantic media search platform using FastAPI/React enabling natural language queries over personal photo/video libraries; integrated Google Gemini 2.0 Flash for multimodal content analysis and OpenAI text-embedding-3-small (1536-dim) for vector embeddings, achieving sub-200ms search latency via PostgreSQL pgvector with cosine similarity and IVFFlat indexing
- Engineered async background processing pipeline handling image/video uploads with PIL/OpenCV frame extraction, automated thumbnail generation, and JWT-based authentication with refresh token rotation; implemented Redis caching, Slowapi rate limiting (100 req/min), and production Docker/Nginx deployment infrastructure
- **Title:** fastapi-rc | **GitHub:** [github.com/CarterPerez-dev/fastapi-rc](https://github.com/CarterPerez-dev/fastapi-rc)
- Published three-tier Redis caching library for FastAPI providing raw client access, generic CacheService wrapper, and typed per-domain caches with FastAPI dependency injection integration
- Implemented cache-aside pattern with automatic Pydantic model serialization/validation, TTL jitter preventing cache stampedes, and deterministic key generation using SHA256 hashing for query parameter collision resistance

- **Title: Aenebris | GitHub:** <https://github.com/CarterPerez-dev/Cybersecurity-Projects/tree/main/PROJECTS/Aenebris>
- Production-grade reverse proxy in Haskell targeting nginx replacement, leveraging Warp web server (100k+ req/s), STM-based concurrency, and compile-time type safety eliminating memory corruption vulnerabilities
- Implemented TLS 1.2/1.3 termination with SNI multi-domain support, three load balancing algorithms (round-robin, least connections, smooth weighted), active health checking with configurable failure thresholds and recovery states
- Architected security middleware layer with HSTS, CSP, and configurable security presets; HTTP-to-HTTPS redirect middleware; planned ML-based bot detection and WAF integration
- **Title: 60 Cybersecurity Projects | GitHub:** [github.com/CarterPerez-dev/Cybersecurity-Projects](https://github.com/CarterPerez-dev/Cybersecurity-Projects)
- Building collection of 60 security projects from beginner CLI tools to advanced full-stack applications; 5 complete with source code, 55 with detailed implementation guides
- **Encrypted P2P Chat:** Full Signal Protocol implementation with X3DH key exchange and Double Ratchet algorithm providing forward secrecy; WebAuthn/FIDO2 passwordless auth, SurrealDB live queries for real-time delivery, triple-database architecture (PostgreSQL, SurrealDB, Redis)
- **FastAPI Rate Limiter:** Production-grade three-layer defense system with atomic Redis Lua scripts, composite client fingerprinting (IPv6 /64 normalization, TLS/JA3, header ordering), sliding window algorithm with 99.997% accuracy, and circuit breaker pattern with adaptive defense modes
- **Title: stripe-referral | GitHub:** [github.com/CarterPerez-dev/stripe-referral](https://github.com/CarterPerez-dev/stripe-referral)
- Published framework-agnostic referral tracking package with pluggable payout adapters supporting Stripe Connect, Wise, and manual bank transfers; SQLAlchemy-based with Alembic migrations included
- Built adapter pattern abstracting payout providers to two methods (send\_payout, validate\_recipient), repository layer isolating queries from business logic, and collision-resistant referral code generation with automatic retry