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SUMMARY

Backend and systems engineer with a focus on performance, low-level design, and production reliability. Designed and benchmarked a NUMA-aware concurrent cache achieving 19× throughput over Meta CacheLib, benchmarked on real multi-socket hardware. Contributed to a Go/gRPC microservices migration consolidating 4–7 rented servers into a single internal server, eliminating recurring hosting costs. Authored production backend modules (JWT auth, RBAC, real-time messaging) and open-source systems software in C++20

TECHNICAL SKILLS

Systems & Low-Level: C++20 (concepts, CAS atomics, lock-free design), CMake, memory architecture (NUMA, cache topology), Linux internals, performance benchmarking

Backend: Go, Java, gRPC, Spring Boot, Gin, Express, Node.js, SQL, Bash, Python

Databases: PostgreSQL (GIST constraints, LISTEN/NOTIFY, pg_cron), MongoDB (TTL indexes), Redis, MSSQL

Infrastructure: Kubernetes (kubeadm, Kustomize), Docker, Jenkins, Prometheus, Grafana, Cloudflare

Methodology: Agile/Scrum, Git branching workflows

PROFESSIONAL EXPERIENCE

Backend Engineering Intern (Summer) — Booster BC

Hammamet, Jun – Aug 2025

- Implemented TravelLanda V2 booking lifecycle handlers in Go/gRPC and gateway compatibility adapters
- Built shared library used across 12 supplier microservices: booking types, DB operations, and configuration layer
- Integrated Ristretto caching with Redis, MongoDB, and MSSQL connection pooling
- Contributed to a Go/gRPC migration consolidating 4–7 rented servers into a single internal server, eliminating recurring hosting costs

Go, gRPC, Ristretto, Redis, MongoDB, MSSQL, Protobuf

Backend Engineering Intern (Summer) — Booster BC

Hammamet, Jun – Aug 2024

- Implemented production room-packing and occupancy validation logic for travel supplier booking flows
- Rewrote critical Node.js microservice in 2–3 weeks, hardening book/confirm/cancel edge paths with defensive patterns
- Proposed Node.js/REST to Go + gRPC migration; co-designed architecture and began building the shared common library
- Set up structured request logging infrastructure (MongoDB with TTL indexes) across booking flows

Node.js, MongoDB, Express, Go, gRPC, Redis

PROJECTS

Furrballs — NUMA-Aware Concurrent Cache *Author* C++20, CMake, vcpkg, Cloudflare Pages | [Whitepaper](#) | [GitHub](#)

- Topology-aware concurrent cache for multi-NUMA systems; benchmarked against Meta CacheLib on EC2 c6a.metal — 14.3M ops/s vs 740K ops/s (19× throughput advantage, both systems with full eviction)
- Investigated ARC under concurrent sharded workloads and empirically demonstrated that its adaptive parameter collapses under thread contention — a failure mode absent from the original paper's assumptions (single-

threaded block caching, SOSP 2003); replaced with S3-FIFO (SOSP '23) using a per-slot atomic frequency counter for lock-free hit tracking with zero additional memory overhead

- Implemented SIMD-accelerated hash tables with seqlock-based torn-read protection, cooperative lock draining, and NUMA-aware memory placement as a first-class design input
- Earlier validation on EC2 c6i.metal (2 sockets, 128 vCPUs): lock-free reads expose $2.3\times$ more cross-node overhead than shared_mutex

Esprit Market — Full-Stack University Platform

Backend Lead & DevOps Java 21, Spring Boot, PostgreSQL,

Kubernetes, Docker, Jenkins | espritmarket.shop | [GitHub \(Backend\)](#)

- SRV module: booking state machine, scheduling conflict resolution engine, and priority-weighted scoring with PostgreSQL-native enforcement (GIST exclusion constraints, pg_cron)
- Common module: JWT dual-token auth with rotation and blacklist, WebSocket handshake interceptor, event-driven dual-channel notification dispatch (email + WebSocket), global exception handling across 12+ types, and RBAC with 11 roles via @PreAuthorize
- Built complete DevOps stack: kubeadm Kubernetes cluster, Jenkins CI/CD pipeline with Trivy security scanning, Prometheus/Grafana monitoring, VPS bootstrap automation
- Selected to represent the class at Bal des Projets (ESPRIT's annual showcase, ~250 projects); shortlisted for the event's incubator program — 1 of 25 from the Bal, 11 ultimately selected.

Hubris — C++20 Game Engine

Author C++20, CMake, Vulkan | [GitHub](#)

- Library-first engine designed for transparency over abstraction; user-controlled entry points and no hidden magic
- Custom smart pointer system (Shared, Weak, Handle, Observer) with CAS-based concurrency semantics built from first principles

StreamLine — C++20 Concurrency Library

Author C++20, CMake, zero dependencies | [GitHub](#)

WaitGroup, Latch, Barrier, and Pipeline primitives with concepts-based type constraints; CTest integration, cross-compiler support (GCC, Clang, MSVC).

EDUCATION

Engineering Degree in Software Engineering (Master's equivalent)

2024 – Expected 2027

ESPRIT — Private Higher School of Engineering and Technology (EUR-ACE accredited)

Preparatory Classes for Engineering (Math-Physics)

2022 – 2024

Faculty of Science of Tunis — Rigorous two-year program modeled on France's classes préparatoires

Languages: Arabic (native) | English (fluent) | French (fluent)