

TOLGAHAN POYRAZ

Software Engineer — Backend & Data Systems

321-313-3547 | tolgahanpoyraz@icloud.com | github.com/tolgahanpoyraz | tolgahanpoyraz.com

EDUCATION

University of Central Florida — GPA: 3.9

Orlando, FL

B.S. in Computer Science & B.S. in Mathematics (double major)

Expected December 2026

- **Honors:** Burnett Honors College; Pi Mu Epsilon Mathematics Honor Society; 3rd Place, Intercollegiate Programming Competition (2023).

EXPERIENCE

Honors Undergraduate Researcher (Graph Theory)

Nov 2025 – Present

University of Central Florida, Department of Mathematics

Orlando, FL

- Discovered an error in a published 2020 theorem and constructed a counterexample family; working on proving a complete trichotomy classifying every split graph's edge reconstruction number as 1, 2, or 3.
- Verified results at scale with a C++ pipeline built on nauty/genbg that exhaustively enumerates and checks all >5 million non-isomorphic split graphs through $n = 13$.

AI Code Quality Analyst (RLHF)

May 2024 – May 2025

DataAnnotation.tech

Remote

- Diagnosed and fixed bugs, logic errors, and hallucinated API calls in AI-generated code across Python, JavaScript, Swift, SQL, and C; promoted to top-tier reviewer responsible for auditing other reviewers' work.

Software Quality Engineer (Contract)

May 2022 – May 2023

Independent Contract

Remote

- Built regression, integration, and end-to-end SoapUI test suites for backend web services, raising coverage above 95% across the service layer while tracking defects through 2-week agile release cycles.

PROJECTS

Public-Safety Incident Pipeline | *Python, AWS Lambda, EventBridge, S3, PostgreSQL*

- Built a production serverless pipeline that continuously ingests, normalizes, and geocodes public-safety CAD records into Postgres; data sources, geocoders, and storage backends sit behind swappable interfaces.
- Minimized database load and cost by buffering writes in S3 and flushing hourly as one idempotent upsert with a recency guard — the database scales to zero between flushes, and replayed batches are harmless no-ops.
- Recovered ~2.5 years of history from an API with no pagination via a recursive substring-partition crawl, distributed across machines through a Postgres work queue (`FOR UPDATE SKIP LOCKED`) with self-healing worker leases.

Concurrent Pub/Sub Broker | *Rust, tokio, WebSockets, Prometheus, Grafana*

- Built a concurrent Rust message broker load-tested with 10,000 simultaneous WebSocket subscribers; separately sustained 619k+ fan-out deliveries/s with zero drops and <4.3ms p99 end-to-end latency in three 30-second release benchmarks.
- Eliminated head-of-line blocking with bounded per-subscriber queues, non-blocking drop-newest delivery, separate socket writer tasks, and registry snapshots that release the read lock before fan-out.
- Instrumented throughput, queue depth, drops, and latency with Prometheus/Grafana; built a monotonic-clock HDR load generator and measured the SLO boundary at 62.5k–65k publishes/s.

Crumb | *TypeScript, Express, MongoDB, React, Flutter, AWS S3*

- Built a UCF free-food discovery platform with an Express/MongoDB API, React web client, and Flutter mobile app, including verified accounts, campus maps, signed uploads, and TTL expiration.
- Designed a reputation-weighted log-odds freshness model with asymmetric crowd votes, exponential time decay, and closed-form expiration thresholds.

Scholar-RAG | *Python, Rust, PyO3, FAISS, FastAPI* | *live demo*

- Built and deployed a RAG system over ~1,000 papers (85k chunks), fusing FAISS dense search and BM25 with Reciprocal Rank Fusion; evaluated with recall@k and MRR.
- Accelerated BM25 ~590× (~57ms → 0.1ms) by implementing a PyO3 Rust inverted index, validated for identical rankings against the Python reference.

TECHNICAL SKILLS

Languages: Python, C, C++, Rust, SQL, JavaScript, TypeScript, Swift

Backend & Infra: PostgreSQL, AWS (Lambda, EventBridge, S3), FastAPI, REST APIs, Docker, Git, Linux

Libraries & Tooling: Pydantic, HTTPX, FAISS, sentence-transformers, pandas, NumPy, React, pytest, GDB