BURAK KUCUKTOPAL

Software Engineer

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Summary

Software engineer with a Mathematics and Physics background who enjoys breaking problems down to first principles and turning them into clean, reliable systems. Track record across full-stack, AI/ML, formal verification, and cryptography. Graduating August 2026 with a dual Master's in Applied Mathematics and Computer Science. Seeking full-time software engineering roles or internships.

Technical Skills

Core Languages	Python, C/C++, C#, Rust, Java
Backend & Systems	REST APIs, .NET, Linux CLI, Git, Docker, CI/CD, GCP (Auth0, Pub/Sub)
Distributed & Data	Spark, Hadoop, concurrency, performance profiling
Machine Learning	PyTorch, NumPy, model optimization, FHE/MPC (applied), statistical learning

Experience

AI/ML Research Intern *Sep 2025 – Present*

NXP Semiconductors – Leuven, Belgium

- Benchmarking privacy-preserving ML inference (FHE, transciphering) to improve latency and memory efficiency on constrained client-side embedded devices.

Backend Engineer Intern *May 2025 – Aug 2025*

Dillen Technologies – Hasselt, Belgium

- Raised platform reliability by implementing 100+ unit tests and 10+ integration tests integrated into the CI/CD pipeline.
- Developed 20+ RESTful API endpoints integrated with GCP (Auth0, Gmail API, Pub/Sub), doubling available email providers.
- Improved domain-driven .NET codebase by adding 10+ Entity Framework entities and refactoring modules to follow clean-architecture patterns.

Formal Verification Engineer Intern *Nov 2024 – Apr 2025*

ASML – Veldhoven, Netherlands

- Designed a standalone proof-of-concept with a C++ formal verification tool to evaluate integration into a 5M+ LOC codebase to ensure message ordering consistency in multi-threaded controllers.
- Communicated architectural constraints and verification findings to 100+ engineers through diagrams and technical presentations.

Frontend Engineer Intern *Jul 2024 – Aug 2024*

Mobile Vikings – Hasselt, Belgium

- Built a responsive Next.js/React/TypeScript dashboard enabling 100+ employees to run autonomous product tests.
- Migrated a 5000+ LOC backend mock to Prisma-SQLite in under 3 days while ensuring comprehensive test coverage.

Education

Dual M.Sc. Applied Mathematics and Computer Science & Engineering *Expected Sep 2024 – Aug 2026*

Eindhoven University of Technology – Eindhoven, Netherlands ***GPA: 3.5/4.0 (CS), 3.2/4.0 (Math)***

- Relevant Coursework: Deep Learning, System Validation, Statistical Learning Theory, Stochastic Modelling, Discrete & Continuous Optimization, Big Data Management

Dual B.Sc. Mathematics and Physics *Sep 2021 – Jul 2024*

Hasselt University – Hasselt, Belgium ***GPA: 3.7/4.0 (Physics), 3.6/4.0 (Math)***

- Graduated 1st in class; presented bachelor's thesis on two-state Markov systems to 110+ attendees at University Conference.
- Relevant Coursework: Probability Theory & Statistics, Dynamical Systems, Numerical Methods, Complex Analysis, PDEs, Statistical Physics

Selected Achievements & Projects

Cryptographic Protocol Implementation – [GitHub] *May 2025 – Present*

Research Paper – Eindhoven, Netherlands

- Benchmarked a 3-step PAKE protocol (Protoss) in Rust, C++, and Python using OpenSSL, Libsodium, and Dalek-Rust.
- Achieved a 20% performance gain over CPace (co-developed by IBM Research).

1st Place, WAIB Summit Hackathon – [GitHub] *Nov 2025*

Web3 & AI Competition – Leuven, Belgium

- Won first place among 80+ onsite participants and additional online competitors in a 24-hour build challenge.
- Implemented invisible document fingerprinting (PDFs, images, audio) with blockchain-backed verification for authorship proofs after modification.