

Alex Tsvetanov

Software Engineer



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Programming Languages

C++11-26

Python

Java

C#.NET

TypeScript

Golang

Systems & APIs

IOCP · io_uring · kqueue
multithreading
protocols (HTTP & gRPC)
synchronization · SIMD

Tools & Environments

Linux · Windows · macOS
Kubernetes · Docker
CMake · Git · SonarQube
strace · wrk · ab · CI/CD

Domains

Algorithms & Data Structures
Concurrency Design
Distributed Systems
System Architecture
Network Protocols
(QUIC, TLS, HTTP, gRPC)
Native Language Bindings

Standards

ISO/IEC JTC 1/SC 22/WG 21
(C++), via BDS TC 57
representing TU-Sofia

Open source

ngtcp2 (QUIC)
MariaDB Connector/C
sketchup-cpp-api (author)

SUMMARY

Systems engineer building cross-platform C++ at the boundary between the network and the operating system: QUIC and TLS, gRPC and HTTP, and the asynchronous I/O underneath them (IOCP, io_uring, kqueue). Upstream contributor to ngtcp2 and MariaDB Connector/C. Currently leads a cross-functional team on Acronis's disaster-recovery engine across 25 data centers. Sits on ISO/IEC JTC 1/SC 22/WG 21, the C++ standards committee, via BDS TC 57.

Writing C++ since 2012 (national algorithmic competitions), in production since 2019.

EXPERIENCE

July 2025
Present

Senior C++ Engineer

ACRONIS · Full-time · Hybrid · Sofia, Bulgaria

- Customers could not recover a workload without leaving the product. Led a cross-functional team of 4 to take Disaster Recovery for Cyber Frame and VHI to GA: failover, fallback and replicas from the console, across 25 global data centers.
- The product shipped with no way to invoice a customer. Built the per-tenant usage metering, aggregation and reporting that made it billable, then fixed the faults corrupting invoices in four data centers.
- Restoring one file from a Kubernetes backup meant restoring the whole volume. Shipped file-level restore with incremental backup over multi-terabyte clusters, on an agent I rewrote from C++ to Go.
- Build failures were triaged by reading logs by hand. Built an AI-assisted Jenkins build analyser over the Jenkins, Jira, Bitbucket and Git APIs. Integrated the Cypilot SDLC kit into the team's workflow, and now feed it requirements and alternatives from the image-automation work.

July 2023
July 2025

C++ Engineer

CHAOS GROUP · Full-time · Hybrid · Sofia, Bulgaria

- Artists were waiting on an unusable viewport. Re-engineered point-cloud transforms on xsimd (SSE through AVX-512), making it interactive at 5x the previous speed.
- Ruby typos in the V-Ray integration were reaching customers at runtime. Moved the boundary to compile-time checks with sketchup-cpp-api, removing a class of defect entirely; Chaos open-sourced it.
- Refactored rendering subsystems for thread safety and cache locality, eliminating high-frequency crashes across varied hardware and scene scales.

Sep 2022
July 2023

Software Architect

SCIA · Full-time · Remote · Leuven, Belgium

- Designed the migration of monolithic Visual C++ logic from legacy COM services to a modern gRPC and Redis-based architecture.
- Modernized the global build system using CMake and vcpkg, unblocking cross-platform development for legacy structural engineering software.
- Directed the evaluation and adoption of gRPC to replace aging internal protocols, ensuring long-term system scalability and interoperability.

July 2022
Sep 2022

C++ Back-end Developer

POKERSTARS · Full-time · Hybrid · Sofia, Bulgaria

- Backend C++ on a distributed platform serving 55,000+ concurrent users, where a wrong answer is a compliance breach rather than a slow page.
- Built the per-jurisdiction rules engine enforcing different legal limits per market from one shared service, so a new market meant configuration rather than a fork.
- Delivered high-availability transactional systems with zero tolerance for database inconsistency under sustained load.

June 2021
July 2022

Full-stack Developer

VMWARE · Full-time · Hybrid · Sofia, Bulgaria

- Optimized Solution Builder SQL queries, reducing execution from 30s to 1.5s and resolving systemic deadlocks for thousands of users.
- Delivered Spring Boot/Angular features for enterprise service bundling, managing complex role-pairing and automated quote generation.
- Acted as the primary technical resource for front-end performance and styling, mentoring the team on UI best practices and modular Angular components.



References

While in high school, Alex's interests focused on AI and Society 5.0. His innovative thinking led us to include him in a specialized young researchers' team for our studies on "Society 5.0 towards 2030". His AI results were further extended for a virtual teacher, providing a visionary outlook for the future of smart education. Alex is a fast-progressing and highly innovative researcher.

Assoc. Prof. Zlatogor Minchev
JTSAC Director
IICT-BAS, March 2026

Alex consistently demonstrates outstanding technical skills and a fearless approach to complex challenges. During our time together, he was instrumental in implementing key features and driving significant infrastructure improvements, directly contributing to the success and stability of our projects.

Noel Warren
Senior Software Developer
Chaos, June 2025

As part of the Architecture team, whose main responsibility was to prototype and introduce innovations, Alex Tsvetanov excelled as a fast learner. No matter which technology we picked (gRPC, Redis, vcpkg), he was always able to quickly learn it and directly build a fully functional prototype. And that was never easy, as he often needed to combine code that was tens of years old with recent technology that was not even suitable for our target platform.

Jan Striteský
Lead Software Architect
SCIA, April 2023

Alex is not only an excellent programmer, but a sociable and motivated colleague with whom it is pleasant to communicate. He is extremely organized and can be relied upon to learn quickly and clearly, as well as to perform complex tasks independently. I am impressed with his attitude towards the work and the quality results he has achieved.

Irina Drencheva
Software Dev Manager
Codix, October 2019

May 2019
Sep 2019

C++ Software Developer

CODIX · Part-time · On-site · Sofia, Bulgaria 

- Developed core financial modules including lending, factoring, and debt collection for 9 international Tier-1 banking and financial institutions.
- Maintained and extended high-stakes C++ "night jobs" and background processing services, ensuring data integrity for global financial close cycles.
- Implemented 100+ feature extensions within a shared codebase, balancing client-specific requirements with a unified product architecture.



EDUCATION

Sep 2023
June 2026

Computer and Software Engineering

B.ENG., STATE-FUNDED · Technical University of Sofia, Bulgaria 

Thesis: "Design and Development of a Compile-time ORM library in C++"

Full-time, Grade: Excellent, 240 ECTS.



Sep 2022
June 2023

Engineering Technology

B.ENG., SELF-FUNDED · Katholieke Universiteit Leuven, Belgium 

Full-time, Terminated program in English.



Sep 2021
June 2022

Industrial Engineering in English

B.ENG., STATE-FUNDED · Technical University of Sofia, Bulgaria 

Full-time, Transferred abroad.



Sep 2013
June 2021

Mathematics & Informatics

HIGH SCHOOL, STATE-FUNDED · Sofia High School of Mathematics, Bulgaria

Full-time, Grade: Excellent.



PUBLICATIONS

Nov 2025

Optimizing Asynchronous Event Dispatch in Modern C++ Publish/Subscribe Systems

TELECOM 2025, Sofia, Bulgaria · [10.1109/TELECOM66943.2025.11304088](https://doi.org/10.1109/TELECOM66943.2025.11304088)

Alex Tsvetanov



June 2025

Modern C++ Publish/Subscribe Pattern: Design, Challenges, and Implementation

ICEST 2025, Ohrid, North Macedonia · [10.1109/icest66328.2025.11098436](https://doi.org/10.1109/icest66328.2025.11098436)

Alex Tsvetanov · Assoc. Prof. Ivan Stankov, Ph.D.



Nov 2024

Matching Text from Start to Finish Against Multiple Regular Expressions

TELECOM 2024, Sofia, Bulgaria · [10.1109/telecom63374.2024.10812214](https://doi.org/10.1109/telecom63374.2024.10812214)

Alex Tsvetanov · Assoc. Prof. Ivan Stankov, Ph.D.



Nov 2017

An Analytical Outlook towards Digital Training Security Transformations

ICAICTSEE-2017, Sofia, Bulgaria · [10.13140/RG.2.2.20333.28645](https://doi.org/10.13140/RG.2.2.20333.28645)

Assoc. Prof. Zlatogor Minchev · Luben Boyanov, PhD · Antoan Georgiev · Alex Tsvetanov



PROJECTS

2017
Present

Coroute/WebFrame++

CROSS-PLATFORM WEB FRAMEWORK · Personal

- Designed and benchmarked a high-performance asynchronous server architecture handling 750'000 to 1.2 million requests per second across Windows and Linux (measured with wrk and ab).
- Implemented a coroutine-based I/O scheduler and lock-free queues, improving throughput by about 13%.
- Developed a modular networking layer that abstracts IOCP, io_uring, and kqueue into a unified asynchronous API.
- Evaluated coroutine scheduling models and caching strategies to minimize latency jitter, and extended the framework with HTTP pipelining and asynchronous file streaming.

part of a
patent application



2018
2022

Headstarter

HIGH-SCHOOL ENTREPRENEURSHIP PROJECT · Team

- Developing and maintaining the Headstarter web platform for connecting young students with businesses offering internships and jobs.
- Supporting the platform goals of guiding students in career paths, networking, and gaining experience.
- Organizing the team's workload for efficient operations and service delivery.



Certificates & Grants

Oct
2025

1st place among the university teams in the cybersecurity hackathon "Big SCHWARZ Interlude" Sofia, Bulgaria

Oct
2019

Runner-up in President's awards "John Atanasoff" Sofia, Bulgaria

Sep
2019

Top 10 with Headstarter, "Best Youth Startup 2019" by the Youth Entrepreneurship Accelerator Ustvarjalnik Ljubljana, Slovenia

May
2019

1st place with Headstarter, National Entrepreneurship Competition by Teenovator Sofia, Bulgaria

Mar
2019

Gold medal in Sofia Open Algorithmic Programming Competition Sofia, Bulgaria

2017
2018

Bronze medals in Softuniada and the "John Atanasoff" international competition; silver in U16 Softuniada Sofia, Bulgaria

Languages

BG

Native ●●●●●

EN

C1 (SAT) ●●●●●

Hobbies

Podcasts about A(u)DHD
Brain Health • Gym
Football • Table tennis
Rock&Metal Music

My mindset

If it breaks under pressure, it was already broken.

Find me



[alex.tsvetanov.2002](#)



[tsvetanov__alex](#)

2016
2019

TechEdu++

LEARNING MANAGEMENT SYSTEM FOR INFORMATICS · Team

- Developing a learning management system (LMS) with Informatics courses for high school students.
- Creating short, engaging video lessons in multiple programming languages.
- Integrating TechEdu++ into the teaching processes at Sofia High School of Mathematics.



VOLUNTEERING

Nov 2025

Lightning talk speaker at OpenFest (on-site, Sofia, Bulgaria)

Delivered a 5-minute lightning talk on leveraging C++20 coroutines (`co_await`) over unified kernel I/O queues, covering the submit/completion queue model, a coroutine-friendly async I/O API, and a thread-pool executor design, demonstrating how modern C++ enables high-throughput, low-latency I/O with synchronous-style code.



Apr 2018
Apr 2020

Author & Co-organizer of Open Doors Day at Sofia High School of Mathematics (on-site, Sofia, Bulgaria)

Organized 3 annual editions of the Open Doors Day event, where 19 alumni shared their career journeys post-graduation. Coordinated all logistics and communication with guest speakers, created the event schedule, and set up the server infrastructure for live streaming and online attendance.



Sep 2017
June 2018

Student Mentor at Dojo@TelerikAcademy (on-site, Sofia, Bulgaria)

Volunteered as a mentor guiding young learners ("Ninjas") through basic programming concepts. Assisted them in building small personal projects, encouraged curiosity, and provided support during hands-on coding sessions.



May 2017
June 2017

Technical Trainer at Software University (on-site, Sofia, Bulgaria)

Delivered Python programming lectures to a diverse group of learners, including working professionals retraining for software roles. Led live coding sessions, assigned practical exercises and homework, and evaluated performance through final exams. Adapted teaching style to accommodate varying experience levels and backgrounds.



Sep 2016
June 2017

Project "Testrain" part of the "A Computer Simulation Virtual Test of Silvan Tomkins' Affect and Script Theory" conference paper (on-site, Sofia, Bulgaria)

Developed the web interface for an experimental platform simulating emotional response theory based on Silvan Tomkins' work. Contributed to the visualization and interaction layer of the research tool used in academic experiments.



Dec 2012
June 2021

Competitor from the Sofia city team in Algorithmic programming (on-site, Sofia, Bulgaria)

Competed in national and international algorithmic competitions from the age of 10, solving hard problems under time pressure with advanced algorithms, data structures and analytical thinking. First olympiad in the winter of 2012, first gold medal in September 2013, and numerous awards at both levels over the following eight years.

