

Aleksandar Krastev

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• <https://alexalex.xyz>

• <https://github.com/Alaxe>

Education

Massachusetts Institute of Technology

Ph.D. in Electrical Engineering and Computer Science

M.Eng. and B.S. in Computer Science and Engineering

GPA 5.0/5.0

SEP 2023–PRESENT

SEP 2019–JUN 2023

- Advisor: Prof. Daniel Sanchez.
- Coursework: Computer System Architecture, Secure Hardware Design; Distributed Systems, Operating System Engineering, Formal Reasoning About Programs; Advanced Data Structures, Theory of Computation, Algorithms for Graphs and Matrices.

Experience

Amazon.com / Software Engineering Intern

JUN 2021–AUG 2021

- Worked on the Amazon Halo mobile app using React Native and TypeScript.

QuantCo / Software Engineering Intern

JUN 2020–AUG 2020

- Migrated Random Forests model training and validation from R to Python using rpy2.

Bulgarian Informatics / Instructor & Problem Author

AUG 2017–JUL 2020

- Developed 2 tasks for contests with 75+ participants from 7 countries.
- Prepared 3 talks on data structures and algorithms for Bulgaria's top 20 students.

Publications

A Tensor Compiler with Automatic Data Packing for Simple and Efficient Fully Homomorphic Encryption. A. Krastev, N. Samardzic, S. Langowski, S. Devadas, D. Sanchez. *PLDI '24*

CraterLake: A Hardware Accelerator for Efficient Unbounded Computation on Encrypted Data. N. Samardzic, A. Feldmann, A. Krastev, N. Manohar, N. Genise, S. Devadas, K. Eldebrawy, C. Peikert, D. Sanchez. *ISCA '22*

F1: A Fast and Programmable Accelerator for Fully Homomorphic Encryption. A. Feldmann, N. Samardzic, A. Krastev, S. Devadas, R. Dreslinski, C. Peikert, D. Sanchez. *MICRO '21 (IEEE Micro's Top Pick for 2022)*

Independent Projects

Nitwit Compiler for a made-up programming language (C++)

retropq Priority queue that can change past operations in $O(\log n)$ (Python)

Gemini Co-op puzzle platformer with real-time multiplayer (JavaScript)

Stealth 2D game of sneaking past guards; computes visible regions in $O(n \log n)$ (JavaScript)

Awards

Gold medal (24th of 335) International Olympiad in Informatics, 2018

Silver medal (29th of 160) European Physics Olympiad, 2019