Aleksandar Krastev

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Education

Massachusetts Institute of Technology EXPECTED JUN 2023

- Pursuing M.Eng. and B.S. in Computer Science GPA 5.0/5.0
- Past courses: Computer System Architecture, Secure Hardware Design, Advanced Data Structures, Distributed Systems, Theory of Computation, Software Construction, Algorithms for Graphs and Matrices.

Experience

MIT / Graduate Research Assistant JUN 2022–PRESENT

- Co-lead the development of an efficient, easy-to use FHE compiler (*under submission*).

MIT / Undergraduate Researcher JAN 2021–MAY 2022

- Helped design the state-of-the-art FHE hardware accelerators (*CraterLake* and *F1*).

Amazon.com / Software Development Engineering Intern JUN 2021–AUG 2021

- Worked on the Amazon Halo mobile 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

CraterLake: A Hardware Accelerator for Efficient Unbounded Computation on Encrypted Data. N.Samardzic, A. Feldmann, **A. Krastev**, N. Manohar, N. Genise, S. Devadas, K. Eldefrawy, C. Peikert, D. Sanchez, *49th International Symposium in Computer Architecture (ISCA-48), June 2022*

F1: A Fast and Programmable Accelerator for Fully Homomorphic Encryption. A. Feldmann, N. Samardzic, **A. Krastev**, S. Devadas, R. Dreslinski, C. Peikert, D. Sanchez, *54th annual IEEE/ACM international symposium on Microarchitecture (MICRO-54), October 2021* **(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