KHAI EVDAEV

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EDUCATION

BOSTON UNIVERSITY Boston, MA

4 BA Majors: Maths, CS, Philosophy, Economics Sep 2017 - January 2022

GPA: 3.79 (Magna Cum Laude)

Honors: 1st in class (College Prize 2021) in Computer Science, Philosophy Interdisciplinary Award, 3 Undergrad Research Awards, Dean's List 2017-2021

Relevant Courses: Real & Complex Analysis, Theory of Algorithms, PDEs and ODEs, Probability, Mathematical Logic, Data Science, Operating Systems, Distributed Systems.

SUMMARY

My research interests are broadly in theory of algorithms and complexity, combinatorial optimization and NP hard problems, and mathematical/computational biology. I also have extensive programming experience at the kernel and higher abstraction layers (python, c++).

RESEARCH & WORK EXPERIENCE

Funded Research on Mathematical Biology **Sep 2020 - May 2021**

- Applied PDEs & ODEs to create a mathematical model for interactions between 2 main signaling proteins (BMP & Nodal) that initiate embryo gastrulation and simulated on Matlab with Finite Difference Approximations
- Programmed and simulated the model on python with finite difference approximation
- Developed a superior model that resembled general behavior of 2 signals by incorporating a bi-stable front equilibrium solution
- Wrote an extensive white-paper describing the model and the simulations

Software Engineer Researcher at Trimble Maps **Match 2023 - Present**

- Solved NP hard combinatorial optimization problems in the routing world: VRP & TSP
- Designed, implemented and tested novel improvement heuristic algorithms for the TSP for over 60k daily clients which secured a $2mill contract with a customer
- Co-designed a novel algorithm for ranking asymmetricity of a matrix for the TSP and used it for QA testing of a client product
- Collaborated and lead an intern on a research project and lead team discussions on software engineering practices
- Read algorithmic theory and mathematics research papers in order to find innovative and optimal solutions to problems from the routing world

Software Engineer at SambaNova Systems **September 2022 - March 2023**

- Designed & implemented a Network Fabric Management daemon for next generation AI Accelerator
- Implemented the end-to-end Fabric Manager encompassing both User and Kernel space in over 2k lines of C
- Presented design document and implementation choice along with git code review sessions with the entire team
- Successfully verified Fabric Manager functionality in an emulation environment and integrated with software stack
- Delivered the design, implementation and verification of the Fabric Manager in 3 months

Funded Research on Mathematical Philosophy of Plato **Jan 2019 - May 2019**

- Investigated the epistemological questions raised in Plato's *Republic* concerning the nature of mathematics
- Wrote a series of mini essays that describe the *Divided Line* and *Cave* allegories in relation to theory of knowledge
- Critiqued modern viewpoints on the nature of mathematics in empirical science

Funded Research on Aristotelian Ethics **Jul 2018 - September 2018**

- Spend a summer in St. Petersburg Russia to conduct a social experiment on Aristotle's *Nicomachean Ethics* regarding the nature of the ultimate good (*eudamonia*)
- Wrote a journal about the conversations with the people about the nature of happiness

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Internship and Projects

A Distributed Cloud Computing Project with Red Hat **Sep 2021 - Dec 2021**

- Began porting into Ceph 25% of a superior caching architecture i/o operation to write a faster Amazon S3 get function via remote read caches and a key-value global/centralized directory
- Handled a complex C++ codebase comprised of thousands of lines and minimal commenting by developers
- Collaborated and lead a team of 4 members in an Agile environment with responsible communication

Implementation of a Distributed Consensus Algorithm Raft **Jan 2021 - May 2021**

- Implemented Raft in Go lang in over 1.5k lines and passed over 30 critical tests
- Studied leader election, synchronization, snapshots, availability and consistency to achieve a near 100% score

TEACHING EXPERIENCE

TA for CS330 Algorithms Class at BU **Jan 2019 - Jan 2021**

- Taught classes of 30 students on algorithm fundamentals: BFS/DFS, Dijkstra's, Divide-and-Conquer, DynamicProgramming, NP & NP-C; explained how to prove correctness & execution time of algorithms via 3 methods
- Managed 8 graders to accomplish the fastest turnover rate in the course history at BU
- Developed 9 detailed and technical tutorial videos for each algorithm and topic

SKILLS

Computer Languages: C, C++, Linux & Bash, Python, GO, MatLab.