Sasha Avreline

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PROJECTS.

Distributed Key-Value Store. Distributed systems graduate course individual course project. 2020.

- Designed and implemented three different variants of a replicated, multi-primary key-value store that achieves eventual consistency via conflict-free replicated data types (CRDTs). Go, MongoDB, RPCs.
- Compared the performance of the three variants while they were deployed on ten geographically distributed Azure VMs. One of the variants achieved a sub-second latency under a throughput of 10 000 operations per second and, as per one metric, outperformed MongoDB's built-in replication service under this test.
- While working on the project, repaired a bug in and added a new feature to GoVector, a UBC distributed systems research group's open source Go library.

Full Stack Trivia Game. Personal Project. 2020-2021.

- Developed a MERN stack and D3.js single-page web application where players earn points based on how well they can guess the years in which various world history events took place.
- Deployed the project on an AWS EC2 instance and on MongoDB Atlas [whatyear.savreline.com].

Operating System Mini-Kernel. Advanced operating systems course project, done in pairs. 2019.

- Implemented in C and X86-32 assembly an operating system mini-kernel consisting of memory management, process scheduling, inter-process communication, a simple shell, and a keyboard device driver.

Mini-Java Compiler. Introduction to compilers course project, done in groups of three. 2019.

- Implemented in Java and X86-64 assembly a compiler for a subset of the Java PL consisting of a parser, type checker, translator to intermediate representation, instruction selector and register allocator.

WORK EXPERIENCE.

BCS Program Teaching Assistant. University of British Columbia, Vancouver, BC, 2019-2020.

- Received the undergraduate teaching assistant award, given to TAs who receive outstanding feedback.
- Developed and delivered review lectures on discrete math, OO design, low-level programming, asynchronous programming, data structures and algorithms. Increased review lectures' attendance 5-fold.
- Debugged students' code during office hours, provided course selection advice and emotional support to students in difficult situations.

Research Associate and Laboratory Technician. University of Waterloo, Waterloo, ON, 2010-2011.

- Developed a MATLAB mathematical model of growth factor delivery to stem cells based on 3D reaction-diffusion equations. Optimal solutions formed a significant contribution to a research fellow's Ph.D. thesis.

Provided mathematical modelling and CAD mechanical design services to an engineering-physics company (2020, 2016). Six internships in chemical engineering and physics (2016, 2006-2008). Tutored mathematics (2003-2013).

EDUCATION.

- **Bachelor of Computer Science (BCS)** [GPA: 90.0%] 2017–2020
  University of British Columbia, Vancouver, BC
- **Course Work in Advanced Mathematics** [GPA: 82.9%] 2013–2014
  University of British Columbia, Vancouver, BC
- **Bachelor of Applied Science (BASc)** [GPA: 76.8%] 2005–2011
  Chemical Engineering with Mathematics Option
  University of Waterloo, Waterloo, ON
  Sandford Fleming Foundation John Fisher Award for Leadership awarded at graduation

TECHNICAL SKILLS.

- **Languages:** Java, JavaScript, C, Go, Julia, MATLAB, HTML5, LaTeX
- **Tools and Frameworks:** Linux, AWS, Azure, Git, Vim, Docker, Node.js, React.js, Bootstrap
- **Databases:** MongoDB

INTERESTS. Automotive restoration and repair, restoration of antique equipment, photography, reading, skiing.