Sasha Avreline

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PROJECTS.

Distributed Key-Value Store. Distributed systems graduate course individual 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). Golang, MongoDB, RPCs.
- Compared the performance of the different variants while 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, out-performed MongoDB's built-in replication service under this test.
- While working on the project, added a new feature and repaired a bug in GoVector, a UBC distributed system research group's open source Golang library (PRs under review).

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 are able to guess the years in which various world history events took place.
- Deployed the project on an AWS EC2 instance running Apache2 web server [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 a register allocator.

WORK EXPERIENCE.

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

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

Full-time Research Associate. 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 (2016, 2020). Six internships in chemical engineering and physics (2006-2008, 2016). 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:** Git, Vim, Node.js, React.js, Bootstrap, AWS, Azure, Apache2
- **Databases:** MongoDB

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