

# Shilei Lin

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## Summary

I am currently a master of science (thesis) student in the School of Computer Science at McGill University. My research interests lay in the field of high performance computing and designing efficient algorithms in C++. I am also a professional full-stack developer specializing in web-based methodologies. I am seeking for a job as a software developer.

## Education

### McGill University

Montreal, Quebec, Canada

M.Sc. IN COMPUTER SCIENCE, GPA 3.85/4.0

Aug. 2019 - Exp. Oct. 2022

- Thesis student, affiliated with Scientific Computing Lab and supervised by Prof. Xiao-Wen Chang.
- **Key Modules:** Algorithmic Game Theory, Modern Computer Games, Optimization, Applied Machine Learning, and Computer Vision.

### Saint John's University

Collegeville, Minnesota, USA

B.A. IN COMPUTER SCIENCE AND MATHEMATICS, GPA 3.73/4.0 WITH HONOR CUM LAUDE

Jan. 2014 - May. 2017

- Awarded International Student Scholarship for 4 years, and Dean's List in the academic years 2015 and 2016.
- **Dissertation:** 'High-Performance Techniques Applied in Partial Differential Equations Library' supervised by Prof. Mike Heroux, and Prof. Michael Tangredi
- **Key Modules:** Numerical Analysis, Mathematical Modeling, Computer Systems, Data Mining, and management.

## Skills

### Programming Language

C++, Java, MySQL, Matlab, VueJS, LaTeX

### Programming Interface/Tools

CoLab, PyTorch, OpenMP

### Operating System

Linux, MacOS

### Data Engineering

Spring Framework/Boot, Hibernate, MySQL, Apache Hadoop (Basic)

### Tools

IntelliJ Idea, CLion, PyCharm, Unity, Git, Visual Studio, VS Code, MATLAB, Mathematica

### Languages

Chinese, English, Japanese (Basic)

## Academic Projects

### Parallel Algorithms for Linear Model based Integer Parameter Estimation

McGill University

RESEARCHER

June. 2020 - Present

- Design and implement the parallel algorithm with asynchronous iterations for estimating the parameter vector in the integer linear model as a solution to the corresponding integer least square problems, coded in C++ with OpenMP.
- Implement parallel algorithms for Lenstra–Lenstra–Lovász lattice basis reduction and Gram-Schmidt QR factorization.
- Examine the bit error rate, convergence speed, and running time and provide the complexity analysis of these parallel algorithms and compute Canada for testing.

### Applied Machine Learning Projects

McGill University

Winter 2020

- Performed classification algorithms from scratch, including logistic regression, support vector machines, decision trees, and Bernoulli Naive Bayes.
- Examined model performance with different hyperparameters for random forest and Ada boost.
- Implemented the multilayer perceptron from scratch in Python and investigated the mean cost and accuracy of Residual Neural Networks using various activation functions and optimizers.

## Modern Computer Games Projects

McGill University

Fall 2019

- Implemented character physics simulation using Verlet integration and design of virtual worlds using Unity and C#.
- Applied maze pathfinding algorithm and GOAP-based AI planner from scratch for computer agents.

## Parallel Computing Project

St. John's University

UNDERGRADUATE RESEARCH ASSISTANT

Mar. 2016 – May. 2017

- Designed and evaluated the performance difference in solving partial differential equations using various data presentations in the high-performance scientific computing library *Trilinos* in C++.
- Performed an update to a finite element method library *deal.ii* with the latest version of *Trilinos* and tested on clusters.

## Work Experience

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### McGill University

Montreal, Quebec, Canada

TEACHING ASSISTANT & GRADUATE COURSE ASSISTANT

Jan. 2020 – May. 2022

- Teaching assistant for COMP 251 Algorithms & Data Structures, COMP 350 Numerical Analysis and COMP 322 Introduction to C++.
- Provided assistance to students with assignments and labs and graded their exams.
- Held night lab hours to assist students in understanding concepts and tutored students with field-related materials.
- Assisted course instructors in preparing course materials.

### Chengdu Zhishicheng Education Co, LTD.

Chengdu, Sichuan, China

PROJECT MANAGER AND SOFTWARE ENGINEER

Feb. 2018 – Jul. 2019

- Developed a web-based educational administrative management platform and design schemes for different software needs, constantly engaged with teachers and students to make adjustments.
- Ensured the educational platform achieved administrative objectives and provided software training to different groups of students and teachers in the organizations.

### Guoxin YoueData Co, LTD.

Chengdu, Sichuan, China

SOFTWARE ENGINEER

Jun. 2017 – Feb. 2018

- As part of the software development team which designed and maintained the big data management platform based on the disparate system in Agile method with HDFS architecture, this platform is the company's main product which is implemented in Java.
- Collaborated with clients on-site and executed process analysis and system deployments by providing technique advice, software tutorials, and end-user training sessions.
- Provided software development training for junior Java developers in the development division.
- Awarded the Best Development Team in the company internal competition in 2017.

## Extracurricular Activity

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### AwakeAI

Montreal, Quebec, Canada

SOFTWARE DEVELOPER

Dec. 2020 – Present

- Develop and design web-based platform application and manage social media (LinkedIn, Youtube), domains, designing Logos, PPTs, and etc.
- Traction: 1. 3rd Place, Dobson Bootcamp (Summer 2022) & Cup Competition; 2. Participant of Dobson X-1 Accelerator (Summer 2022); 3. Finalist, 2022 McGill Clinical Innovation Competition Finalist (Winter 2022).

### McGill IEEE Student Branch

Montreal, Quebec, Canada

DIRECTOR OF WEB

Aug. 2021 – May. 2022

- Develop proposals for website maintenance and development.
- Direct and manage the IT subcommittee to ensure continued availability of all web/IT services and meet the Branch's goals.