

Edmond La Chance, Ph.D

edmondlachance.com

github.com/mitchi

Edmond.Lachance@uqac.ca

EDUCATION

2008-2011 B.S, Université du Québec à Chicoutimi

2011-2013 M.S, Université du Québec à Chicoutimi

Algorithms for the minimum spanning tree problem

This master thesis empirically compares various ways of implementing minimum spanning trees. Several data structures and algorithms are implemented in C++ and measured: Union-Find, Binomial Heap, Binary heap, Fibonacci heap, Prim's Algorithm, Boruvka's Algorithm, Kruskal's Algorithm.

2013-2021 Ph.D in Software Verification & Cluster Computing, Université du Québec à Chicoutimi

Extended Combinatorial Testing using Graph Algorithms and Apache Spark

This thesis presents a generalization of t-way testing and reductions to graph coloring and vertex cover problems using distributed algorithms. The algorithms were implemented using Apache Spark with Scala. Experimental results were obtained using computer clusters provided by Compute Canada.

WORK HISTORY

Software Engineer at Timesphere

August 2021 – Present

Working on the Timesphere Application with the SAQ team (Société des alcools du Québec). The Timesphere application is used to manage employee schedules. I currently work as a Full-Stack Engineer fixing bugs, developing new features in the backend in Java, and porting existing features to the new React/Redux-toolkit frontend.

Technologies used: Typescript, Redux-toolkit, Java with Spring Framework.

Lecturer, Université du Québec à Chicoutimi

Classes taught:

8INF803 (Distributed Databases)

2015-2021

In 8INF803, students learn about distributed databases, crawling and distributed data processing. The class shows many useful data structures for data intensive applications such as B+Trees, LSM, Bloom Filters, HyperLogLog, Bitmap indexes etc. On the programming side, we mostly use Apache Spark, Scala, Java and Python. We also show how to implement iterative algorithms with proper performance optimizations.

8GIF128 (Web programming)

2015

In 8GIF128, we teach HTML, CSS, JavaScript, DOM, REST and WebSockets. The final project is a website that communicates with several services using WebSockets.

PROJECTS

TSPARK – A distributed combinatorial test generator

<https://github.com/mitchi/TSPARK>

TSPARK is an open-source project developed for my Ph.D thesis. TSPARK is written in Scala, using the Apache Spark cluster computing framework, and has around 30k lines of code. TSPARK contains distributed algorithms for solving graph coloring and hypergraph vertex problems. It also contains a hybrid algorithm called Distributed IPOG. Every algorithm was extensively tested to optimize performance. TSPARK internally uses bitsets and compressed bitmaps to optimize its graph data structures. Finally, TSPARK is self-contained .jar file that can easily be run on computer clusters and supercomputers running Slurm.

SKILLS

Apache Spark

Java

Scala

C/C++

SQL

Slurm Cluster Manager

Spring Boot

Node.js / Socket.io

Typescript, React and Redux Toolkit

JavaScript

Git

HTML and CSS

LaTeX

x86 assembly language

