Edmond La Chance, Ph.D
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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 Developer at Yoppworks **January 2022 - Present**

Software Engineer at Timesphere **August 2021 – December 2021**

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.

CTL Simulator
CTL Simulator is a small project (1k lines C++) that implements the CTL labeling algorithm for model checkers.

ASM FORUM
ASM Forum is an old project that implements a simple discussion forum with threads/topics/replies and users using x86 assembly language, CGI processes, and SQLite as the database.

SKILLS

Apache Spark
Java
Scala
C/C++
SQL
Typescript, React and Redux Toolkit
JavaScript
JIRA, Git and Github
HTML and CSS
LaTeX

Slurm
Spring Boot
Node.js / Socket.io

x86 assembly language

CERTIFICATIONS

LightBend Certified Reactive Architect
LightBend, Inc
Issued Jan 2022, Expires Jan 2025