

- **10 years** of relevant work experience | **M.Sc Computer Science**, McGill University
- Languages - C++, Python, Java | Interests - Compilers, Computer Architecture, Accelerators, Supercomputing, LLVM, RISC-V

WORK EXPERIENCE

Barcelona Supercomputing Cente

Research Engineer (RE2)

April 2019 - Present

Barcelona, Spain

- As part of the European Processor Initiative project, I am in charge of adding autovectorization support in the LLVM optimizer for the RISC-V V-extension based accelerator processor.

Huawei Canada Research Center - Compiler Technologies Lab

Senior Software Engineer

September 2017 - May 2018

Toronto, ON, Canada

- Developed a new way to dynamically resize available heap size in the JVM (with Serial GC).
- Contributed to the compiler framework being developed for Huawei's new AI processor.

INRO

Senior Developer

December 2014 - September 2017

Montreal, QC, Canada

- Wrote a **new compiler and memory management system** for Emme's matrix calculator language. Emme is a travel demand modelling system for transportation forecasting, used by some of the world's most populous cities.
 - Achieved **up to 30x faster** performance. Efficient even for computations on **large matrices (over 1 GB)**. (C++ and Python)
- Designed and developed **data analytics tools for public transit data**.
 - Enabled our clients to visually analyze and query things like loads, delays, and stop activities. (Python)
- Designed and built the **data import backend and API** for CityPhi, an analytics platform for spatial and mobility data at scale.
 - Support for various geographical and transit data formats like shapefile, OSM and GTFS.
 - Optimized to handle large datasets by importing data only in specified spatial and/or time windows. (C++ and Python)

ISENCORE Technologies

CTO and co-founder

September 2013 - December 2014

Montreal, QC, Canada

- Won **first prize with \$10,000 in funding** in the **McGill Dobson cup** (SME category) 2014 startup competition.
- Delivered the **winning pitch** to get selected as **one of the 20 startups worldwide** to present at SLUSH 2014.
- Developed the **3D object discretization** module for Quirdity, ISENCORE's 3D simulation engine.

McGill University - Sable Compilers Research Lab

Research and Teaching

January 2012 - April 2014

Montreal, QC, Canada

- **Research Assistant, Sable Lab** - My research included program analysis and static compilation of dynamic languages.
 - Wrote **MiX10 : a MATLAB to X10 (programming language) compiler for high-performance**. (Java)(bit.ly/getmix10)
 - Achieved **7 times (mean) faster** performance compared to the standard MATLAB implementation.
 - Designed a new algorithm to identify and safely typecast floating point values to integers at compile time for improved performance.
 - Discovered a **severe performance bottleneck** in the X10 compiler and helped improve the X10 compiler.
- **Teaching Assistant** - Program Analysis and Transformations, Compiler Design, and Introduction to Computer Systems.

AT&T

Systems Engineer

September 2008 - August 2011

Pune, India

- **Led** a team of 4 for **performance management** of AT&T's online and mobility frontend and backend applications.
 - My team's job was to design and develop tests, analyze results, and troubleshoot performance issues.

Sun Microsystems

Intern - Student Tech Lead, APAC region/Campus Ambassador

January 2007 - May 2008

Bangalore, India

- One of **only 5 Tech Leads worldwide**. Evangelized and taught a course on OpenSolaris.

PUBLICATIONS

- Vineet Kumar and Laurie Hendren. **MiX10 : Compiling MATLAB to X10 for High Performance**. In Proceedings of the 2014 ACM International Conference on **Object Oriented Programming Systems Languages & Applications (OOPSLA '14)**.(bit.ly/1papr1)
- Vineet Kumar and Laurie Hendren. **First steps to compiling MATLAB to X10**. In Proceedings of the 2013 ACM SIGPLAN X10 Workshop, **X10 '13** co-located with **PLDI 2013**.(bit.ly/2papr2)

EDUCATION

McGill University

M.Sc. in Computer Science

April 2014

Montreal, QC, Canada

- Won the DFW scholarship awarded to **exceptional international Research Master's** students.

SASTRA University

B.Tech. in Computer Science & Engineering

June 2008

Thanjavur, India

- Won the Dean's list scholarship for being among the **top 10%** students in the University.