VINEET KUMAR

github.com/vntkg, linkedin.com/in/vntkg

vineet.kumar@mail.mcgill.ca, +34-653-60-21-02

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

WORK EXPERIENCE

Barcelona Supercomputing Center — April 2019 - Present
Research Engineer — *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.
- Collaborate with the LLVM community to bring predicated loop vectorization support to LLVM open source codebase. Participate in reviews and discussions for adding scalable vector support to LLVM.

Huawei Canada Research Center - Compiler Technologies Lab — September 2017 - May 2018
Senior Software Engineer — *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 — December 2014 - September 2017
Senior Developer — *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 — September 2013 - December 2014
CTO and co-founder — *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 — January 2012 - April 2014
Research and Teaching — *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.

Infosys (for AT&T) — September 2008 - August 2011
Systems Engineer — *Pune, India*

- **Led** a team of 4 for **performance management** of AT&T's online and mobility applications. Test and resolve performance issues.

Sun Microsystems — January 2007 - May 2008
Intern - Student Tech Lead, APAC region/Campus Ambassador — *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 — April 2014
M.Sc. in Computer Science — *Montreal, QC, Canada*

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

SASTRA University — June 2008
B.Tech. in Computer Science & Engineering — *Thanjavur, India*

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