

- **6+ years of relevant experience** in software design and development. | **M.Sc Computer Science**, McGill University.
- Programming languages - *Proficient*: Python, C++, Java | *Prior experience*: X10, MATLAB.
- Skills and interests: System software, compilers, data analytics, distributed computing, backend systems.

WORK EXPERIENCE

INRO

Senior developer

December 2014 - present

Montreal, QC, Canada

- Contribute to research and development of **Emme** and **CityPhi**. Emme is a travel demand modelling system for transportation forecasting. CityPhi is a visual analytics software for large-scale spatial and mobility data.
- Built a new matrix calculator tool by writing a new parser and evaluator for Emme's matrix expression language. (bit.ly/1N5geA8)
- Achieved **1.5x** to **30x** speedup depending on expression details and hardware resources.
- Built a memory management system to efficiently handle computations on matrices over 1GB in size. (Python and C++)
- **Data analytics for GTFS and travel smart-card data**: Developed techniques and tools to visually analyze public transport smart card data. These tools are used by clients to analyze and query things like loads, delays, and stop activities.
- **Design and develop new Python API modules** for Emme. Includes designing JSON input specifications used as interface by the frontend, generating intermediate code (Emme macros) for the Fortran backend, and parsing the output to generate JSON reports.
- Work on optimizing and extending CityPhi's core data backend. Also Designed and Developed CityPhi API for importing geo and transport data from various data formats like Shapefiles, OSM, and GTFS.

ISENCORE Technologies

CTO and co-founder

September 2013 - December 2014

Montreal, QC, Canada

- Developed the 3D object discretization module for **Quirdity**, ISENCORE's 3D simulation engine. It generates a voxel tree and the associated data for a 3D model. (C++)(<http://bit.ly/discretizer>)
- Won **first prize** in the **McGill Dobson cup** 2014 startup competition.
- Delivered the **winning pitch** to get selected as **one of the 20 startups worldwide** to present at SLUSH 2014.

McGill University

Compilers 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.
 - Designed and developed **MiX10** : a **MATLAB** to **X10** compiler for high-performance, under **Prof. Laurie Hendren's** supervision and with direct inputs from the **X10 design team at the IBM T.J. Watson research center**. (Java)(bit.ly/getmix10)
 - Achieved **7 times (mean) faster** performance compared to the standard **MATLAB** implementation.
 - Discovered **2 bugs** and a **severe performance bottleneck** in the **X10** compiler.
- **Teaching Assistant** - Program Analysis and Transformations, Compiler Design, and Introduction to Computer Systems.

Infosys Technologies Ltd.

Systems Engineer

September 2008 - August 2011

Pune, India

- **Led a team of 4 for deployment performance management** for AT&T's online and mobility frontend and backend applications.
 - My team's job was to design and develop performance test scripts, analyze results, and troubleshoot performance issues.
 - Worked on 8 projects and they all exceeded performance SLA under peak loads.

Sun Microsystems

Intern - Student Tech Lead, APAC region/Campus Ambassador

January 2007 - May 2008

Bangalore, India

- Promoted from being one of the **only 27 Campus Ambassador across India** to one of the **only 5 Tech Leads worldwide**.
 - **Taught** a course on OpenSolaris at the university. Conducted webinars and developed tutorials for ambassadors worldwide.

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 (CGPA: 3.56/4.00)

April 2014

Montreal, QC, Canada

- Master's thesis reviewed as **"Excellent"** by the external reviewer.

SASTRA University

B.Tech. in Computer Science & Engineering (CGPA: 8.93/10.00)

June 2008

Thanjavur, India

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

OTHER PROJECTS

- Analysis to identify complex numerical values for **MATLAB** programs. (bit.ly/iscomplex)

- Developed a language to express information propagation through library function calls.
- FreeMeLegal: An Open source license recommendation engine. (bit.ly/freemelegal)