

Nicholas V. Giamblanco

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EDUCATION **University of Toronto**, Toronto, Ontario Expected December '25
Doctor of Philosophy, Computer Engineering & Neuroscience
Supervised by Prof. Andreas Moshovos and Prof. Taufik Valiante

University of Toronto, Toronto, Ontario November '19
Master of Applied Science, Electrical & Computer Engineering,
Thesis: Dynamic Memory Allocation Techniques for High-Level Synthesis
Supervised by Prof. Jason H. Anderson
CGPA: 3.95/4.0

Ryerson University, Toronto, Ontario June '17
Bachelor of Engineering, Electrical & Computer Engineering
CGPA: 3.74/4.33

PUBLICATIONS *Conference Papers*

- **Nicholas Giamblanco** and Andrew Schmidt. `vlang`: A Verilog Front-End for LLVM. In *Progress. IEEE*, 2021
- **Nicholas Giamblanco** and Jason Anderson. ASAP: Automatic Sizing and Partitioning for Dynamic Memory Heaps in High-Level Synthesis. In *2019 International Conference on Field Programmable Technology (FPT)*. IEEE, 2019
- **Nicholas Giamblanco** and Jason Anderson. A Dynamic Memory Allocation Library for High-Level Synthesis. In *2019 29th International Conference on Field Programmable Logic and Applications (FPL)*. IEEE, 2019
- **Nicholas Giamblanco** and Prathap Siddavaatam. Keyword and Keyphrase Extraction Using Newton's Law of Universal Gravitation. In *2017 IEEE 30th Canadian Conference on Electrical and Computer Engineering (CCECE) (CCECE 2017)*, pages 625–628, 2017

AWARDS

Ontario Graduate Scholarship, University of Toronto	'20
University Of Toronto Fellowship, University of Toronto	'18
Edward S. Rogers Sr. Graduate Scholarship, University of Toronto	'17
DRF URE, Ryerson University	'16
Dean's List, Ryerson University	'15,'16,'17
REC, Ryerson University	'15
Entrance Scholarship, Ryerson University	'13

SOFTWARE

Languages	
Procedural:	MIPS, x86 and ARM Assembly, C
Functional:	Make, CMake, Haskell, Matlab
Object Oriented:	Java, Python, Ruby, C++
Markup:	HTML, XML, DTD, \LaTeX , Markdown
Scripting:	Javascript, JQuery, Bash
Style Sheets:	CSS, XSLT

Databases

Relational: PostgreSQL, Oracle, MySQL, sqlite3
 Key-Value: MongoDB

Website Technology

Web Frameworks: Firebase, Flask, Ruby on Rails, JRuby on Rails

Misc

Big Data: Hadoop, Spark
 Cloud Computing Systems: AWS
 Version Control Systems: git, GitHub, BitBucket
 Continuous Integration Systems: BuildBot, TeamCity
 Frameworks: Spring Framework
 OS: OSX, Windows, Linux, Android, RTOS
 Compiler Frameworks: gcc/g++, LLVM, Clang

HARDWARE

Description Languages: Verilog, VHDL
 Development Environments: Xilinx ISE, Xilinx Vivado & Intel/Altera Quartus
 High-Level Synthesis Tools: LegUp, Vivado HLS, Bambu HLS
 Devices: Arduino, USRP, Raspberry Pi, Xilinx, Altera

**INDUSTRY
EXPERIENCE**

Cerebras Systems, Toronto, ON, CA August '20 - January '21

Member of Technical Staff - Compiler Engineer

- Created a replay debugger for Cerebras's CS1 Architecture with a number of cutting-edge debug features such as: reverse debugging, value tracking, performance profiling, etc. This was a self-managed project and is used company-wide.
- Developed and improved several compiler passes for Cerebras's compiler backend
- Introduced a random program generation testing-infrastructure to test the correctness of Cerebras's compiler backend. This came with visualization software to highlight certain results of the test.
- Improved Cerebras's benchmarking suite to clearly identify how changes in the compiler affect performance.

Untether AI, Toronto, ON, CA

January '20 - August '20

Compiler Engineer

- Principal Engineer for designing and maintaining Untether AI's LLVM-compiler backend.
- Independently developed the compiler-backend 6 months ahead of schedule.
- Improved code-performance through intermediate-language (IR) and instruction level optimizations.
- Increased productivity of the company by allowing software-developers to use the C and C++ Language.
- While managing a small team, I assigned tasks and provided frequent updates to ensure development met or exceeded deadlines and performance targets.

Information Sciences Institute, Arlington, VA, USA

January '20 - June '20

Researcher

- Researched the performance impacts of auto-generated neural network kernels with Vivado HLS and Bambu HLS.

- Improved the performance of HLS-generated hardware-accelerators through the automatic selection of C/C++ functions.

Information Sciences Institute, Arlington, VA, USA June '19 - August '19
Visiting Research Assistant

- Contributed to project REAPER (Replacing Aging Electronics Rapidly) by developing a hardware description language (HDL) to LLVM compiler.
- Improved the performance of an algorithm used in a NASA project by $30,000\times$, by using high-level synthesis techniques.

University of Toronto, Toronto, ON, CA January '18 - August '18
Web Developer

- Was responsible for recreating & revitalizing University of Toronto's Electrical and Computer Engineering group website. (<http://www.eecg.utoronto.ca/>)

LynkUp, Inc., Toronto, ON, CA July '17 - September '17
Software Engineer

- Was responsible for the full-stack development of a platform which pairs individuals seeking long distance travel with the appropriate driver for their journey.

DataChili, Inc., Toronto, ON, CA May '17 - July '17
Software Developer

- Developed core features of the software platform (Social Media Connector, Database Connectors, User Functionality, low level operations) and was a full-stack developer (<https://www.datachili.com/>).

Sample-Gooder Roofing Corporation, Toronto, ON, CA Dec '15 - Feb '16
Freelance Application Developer

- Developed a mobile (Android) tracking application, that monitors an employee's physical location at work.

ACADEMIC EXPERIENCE

LegUp, University of Toronto, Toronto, ON, CA January '18 - Current
Software Developer & Contributor

- Developed LLVM-IR passes to allow dynamic memory allocation schemes to be present within LegUp.
- Developed a novel dynamic memory allocation algorithm.
- Maintained LegUp's code base through the use of version control software (GitHub).

Ryerson University, Toronto, ON, CA Sept '15 - March '17
Researcher

- Investigated security vulnerabilities with modern wireless communication systems, and developed a software suite to target cellular devices
- Developed the OPR website (<http://www.ee.ryerson.ca/opr/>).

TEACHING EXPERIENCE

University of Toronto, Toronto, ON October '17 - December '19
Teaching Assistant

- ECE216 - Signals and Systems
- ECE241 - Digital Systems
- ECE243 - Computer Organization
- ECE253 - Digital and Computer Systems [Head TA]
- ECE1387 - CAD for Digital Circuit Synthesis and Layout

Private Tutor, Toronto, ON

September '17 - June '18

- Was responsible for assisting students studying all subjects at the Grade 12 level by preparing notes, practice examples, assistive tools and micro lectures.

Ryerson University

Jan '16 - April '16

Professor's Assistant

- Prepared assignment and examination questions for a Robotics Course (Course Code: ELE869).
- Assisted with the execution of computational experiments in cryptography, machine learning, and optimization.

Ryerson University

Sept '15 - Sept '17

Academic Tutor

- Provided academic support for students enrolled in the Electrical & Computer Engineering program.
- Provided lessons and tutorials for students, with a practical focus on real-world applications.