

# Tri Minh Nguyen

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EDUCATION	<p><b>Princeton University</b>, Princeton, NJ, USA Sep 2012 – Present</p> <p>Candidate, Doctor of Philosophy (Ph.D.) in Electrical Engineering</p> <p>Master of Arts (M.A.) in Electrical Engineering</p> <p>Adviser: Professor David Wentzlaff</p> <p><b>University of Texas at Austin</b>, Austin, TX, USA Sep 2008 – May 2012</p> <p>Bachelor of Science (B.S.) in Electrical and Computer Engineering</p> <p>Graduated with High Honors.</p> <p>Cumulative GPA: 3.93 / 4.00</p>
RESEARCH INTERESTS & EXPERTISE	<p><b>Interests:</b> manycore, throughput-oriented, GPU architecture, hardware accelerator, machine learning, deep learning (DNN/CNN/LSTM), neuromorphic computing.</p> <p><b>Skills:</b> architectural simulation, performance modeling, RTL design and verification, Android programming, deep learning frameworks.</p> <p><b>Programming fluency:</b> C/C++ 11, Python, Verilog, Java</p>
RESEARCH EXPERIENCE	<p><b>Princeton University</b> <i>Research Assistant</i> Sep 2012 – Sep 2018</p> <p><b>Bandwidth compression:</b> Investigating the problem in throughput-oriented architectures (GPUs/Xeon Phi) and its solutions, including cache compression, link compression, efficient memory layout, efficient HBM/stacked-memory, etc.</p> <p><b>NVM:</b> Studied nonvolatile memory as a replacement for DRAM and provided a novel and high performance logging system for crash consistency.</p> <p><b>Open-source projects:</b></p> <ul style="list-style-type: none"><li>- <b>OpenPITON processor:</b> Designed the cache system, cache-coherence protocol, network-on-chip protocol, and JTAG debug-port for PITON, a 25-core academic manycore processor. Verified the design with directed and randomized assembly tests. Synthesized the design with industrial tools (Synopsys) and taped out in IBM 32nm process. <a href="http://parallel.princeton.edu/piton/">http://parallel.princeton.edu/piton/</a></li><li>- <b>PRIME open-source simulator:</b> key developer of PRIME, a fast, distributed parallel, scalable manycore simulator. <a href="https://github.com/PrincetonUniversity/primesim">https://github.com/PrincetonUniversity/primesim</a></li></ul> <p>Advisor: Professor David Wentzlaff</p> <p><b>University of Texas at Austin</b> <i>Research Assistant</i> Sep 2011 – May 2012</p> <ul style="list-style-type: none"><li>- <b>Hardware accelerator:</b> Conducted a feasibility study of accelerating drug discovery using FPGA, through studying molecular dynamic (MD) algorithm and analyzing the integer/floating point performance of state-of-the-art FPGAs.</li><li>- <b>GPU:</b> Identify and optimize GPU workloads with dynamic compilation through similarity matrices.</li></ul> <p>Advisor: Professor VJ Reddi</p>
SELECTED PUBLICATIONS	<p>Tri Nguyen, and David Wentzlaff, “PiCL: a Software-Transparent, Persistent Cache Log for Nonvolatile Main Memory,” <i>MICRO’18</i></p> <p>Tri Nguyen, Adi Fuchs, and David Wentzlaff, “CABLE: Cache-based Link Compression for Manycore Architectures,” <i>MICRO’18</i></p> <p>Tri Nguyen, and David Wentzlaff, “MORC: Manycore-oriented Cache Compression,” <i>MICRO’15</i></p> <p>Yaosheng Fu, Tri Nguyen, and David Wentzlaff, “Coherence Domain Restriction on Massive Scale Systems,” in <i>MICRO’15</i></p> <p>Michael McKeown, Yaosheng Fu, Tri Nguyen, Yanqi Zhou, Jonathan Balkind, Alexey Lavrov, Mohammad Shahradd, Samuel Payne, Xiaohua Liang, Matthew Matl, and David Wentzlaff “OpenPiton: An Open Source Manycore Research Framework,” in <i>ASPLOS’16</i></p> <p>Michael McKeown, Yaosheng Fu, Tri Nguyen, Yanqi Zhou, Jonathan Balkind, Alexey Lavrov, Mohammad Shahradd, Samuel Payne, and David Wentzlaff “Piton: A 25-core Academic Manycore Processor,” in <i>HotChips’16</i></p>

<b>WORK EXPERIENCE</b>	<b>NVIDIA Research</b> , Redmond, WA, USA Jun 2017 – Sep 2017 <i>Research Intern</i> Investigated and characterized the performance of cutting-edge GPU DNN machine learning algorithms including CNN and LSTM. Devised architectural improvements for future GPUs beyond Volta. Characterized GPU performance as a shared virtual GPU in the cloud. Contributed to the development of the internal GPU simulator widely used in company. Manager: David Nellans
	<b>AMD Research</b> , Boxborough, MA, USA Jun 2016 – Sep 2016 <i>Research Intern</i> Implemented state-of-the-art hardware compression algorithm for super-computing workloads and evaluated energy savings at the RTL/gate-level. Submitted a patent on a novel compression algorithm specifically designed to reduce data movement energy. Manager: Greg Sadowski
	<b>NVIDIA</b> , Santa Clara, CA, USA May 2012 – Aug 2012 <i>Intern</i> Wrote on-die oscilloscope extraction software for quality assurance and used it to analyze transient voltage noise as a cause of failures. Wrote and improved noise virus testing suite to increase fault coverage decrease test time. Manager: Apoorv Gupta
	<b>Samsung</b> , Suwon, South Korea May 2011 – Aug 2011 <i>Intern</i> Investigated the feasibility and benefits of data compression for solid-state drives (SSD), including gzip/DEFLATE, and with fixed block-based compression, and using fingerprinting for variable block-size compression. Manager: Kyungho Kim
<b>TEACHING EXPERIENCE</b>	<b>Princeton ELE301 – Design of Real Systems</b> Fall 2013 & Fall 2017 <i>Assistant Instructor</i> Developed lab assignments for a new course at university. Led weekly lab sessions and designed Android-to-microcontroller interfacing labs.
	<b>UT Austin – Probability and Random Processes</b> Sep 2011 – Jan 2012 <i>University Tutor</i> Instructor for the university's free tutoring program.
<b>HONORS &amp; AWARDS</b>	<b>Student Travel Grant</b> , MICRO'17, ASPLOS'16, ISCA'15, ISCA'14 Supports from ACM, NSF, SIGMICRO, and others.
	<b>University Honors</b> , University of Texas at Austin 2008 – 2012
	<b>Third place</b> , Final Project Dec 2010 EE345L, Embedded Systems Design, UT Austin Microcontroller as a gaming device with impressive 3D capability
	<b>First place</b> in tank simulation AI competition. Dec 2009 EE319K, Intro to Embedded Systems, UT Austin
<b>ACTIVITIES</b>	<b>Princeton EE Musical MelodEE</b> , Mar 2017 <i>Organizer</i>
	<b>Eta Kappa Nu Honors Society</b> , UT Austin Sep 2010 – May 2012 <i>Member</i>
	<b>Study abroad</b> , Sungkyunkwan University, South Korea Jan 2011 – Jun 2011
	<b>Shotokai Karate Club</b> , UT Austin Sep 2008 – May 2010 <i>Member then vice-president</i>
<i>Last updated: July 2018</i>	