LINH V. NGUYEN

1 College Road, Box 1631   Cell: +1 (804) 714-6404
Hampden-Sydney College, VA 23943   Email: NguyenL16@hsc.edu

EDUCATION

Hampden-Sydney College
Bachelor of Science in **Physics (Honors)** and **Applied Mathematics**   May 2016 (expected)
Minor: **Computer Science**
Thesis title: *Optimizations for Finding Ground States of Quantum Ising Spin Glasses*
GPA 3.9729

RESEARCH INTERESTS

Parallel Processing, High Performance Computing, Computer Architecture, Computer Simulation and Modelling.

RESEARCH EXPERIENCES

Blue Waters Intern   May 2015 – Present
National Center for Supercomputing Applications, University of Illinois Urbana-Champaign, IL

> **Developing multi-GPU configuration for accelerating SQL queries.**
> This project focuses on accelerating SQL database queries (SELECTs and JOINs) using the Blue Waters' GPU-enabled nodes. The implementation uses a virtual machine model and a custom data structure, which partitions the data table into fixed-sized groups of rows, to allow the queries to run in parallel. Currently, each node processes its own data before returning the result to the master node in MPMD fashion.

Student Researcher   January 2015 – Present
Hampden-Sydney College, Farmville, VA

1. **Optimizations for Finding Ground States of Quantum Ising Spin Glasses**
   My thesis project in Physics attempts to test the "quantumness" of the alleged first "quantum computer", the D-Wave One. The machine was first introduced in 2011 by D-Wave Systems. Showed that an optimized version of Simulated Annealing for the Ising Problem on a commercial PC is able to match the D-Wave One's performance, in both success probabilities and runtime, on the same test instances.

2. **Building a Small Scale Distributed System**
   Initiated the project and wrote the proposal to raise $3000. The system used 8 Parallella boards, each includes a dual-core ARM Cortex-A9, and a 16-core Epiphany Coprocessor. Added two Intel NUCs to increase performance. Worked with another student in constructing and benchmarking the system.

Research Assistant   May 2014 – March 2015
Laboratory for Computer Architecture at Virginia (LAVA Lab), University of Virginia, VA

1. **Accelerating HotSpot (HS), a thermal package for architectural studies**
   Improved the performance of HotSpot (HS) by porting a CUDA solver to the current version of HS. Wrote the 3D version of HS benchmark for the Rodinia's suite in CUDA,OCL, and OMP. Optimized via caching.

2. **Variable-length encoding on the GPUs**
   Improved a CUDA parallel encoder to work with 256-bit codewords and large input size by partitioning input and merging results. Implemented a parallel histogram to build a realistic Huffman tree for the application. Overlapped data transfer/computations for both the encoder and histogram, resulting in 1.6X and 1.9X speedups respectively, compared to the first CUDA implementation.

Undergraduate Researcher   Summer 2013
Hampden-Sydney College, VA

> **An attempt to model Rydberg atom.**
> Modelled an atomic potential and wavefunction propagations using Ehrenfest Theorem. Implemented RK4 method to solve a set of coupled differential equations and develop phase-space plots for different quantum states.

PRESENTATIONS

"An Attempt to Model Rydberg Atom." Hampden-Sydney Summer Research Symposium, August 2013. "Parallel Computing." Hampden-Sydney Mathematics/CS Department colloquium, October 2014.

HONORS AND AWARDS

- Samuel S. Jones Phi Beta Kappa Award for Academic Excellence, awarded to two students with highest GPAs in class of 2016. Second Honor.   2014
- *Phi Beta Kappa* Honor Society.   Inducted April 2014
- Macon Reed Award for outstanding sophomore in Mathematics/Computer Science.   2014
- Dean of the Faculty's Summer Research Grant.   2014
- Roy B. Sears summer internship scholarship.   2014
- Venable Scholarship for top 5% of incoming freshmen. $2012 - 2016$
- *Chi Beta Phi* Science Honor Society.   2013
- *Pi Mu Epsilon* Mathematics Honor Society.   2013

SELECTED PROJECTS

- Compiler. A gcc-style compiler for the C language developed in CS480. The compiler supports procedures, expressions, and control structures.
- Social Network. A prototype that supports group messages, postings, friendships. Developed in PHP, JavaScript, MySQL, HTML.

LANGUAGES AND TECHNOLOGIES

Proficient: C/C++

Prior Experience: Java, Python, JavaScript, PHP, MySQL, HTML, XML Schema, ASM

Familiar: CUDA, OpenMP, OpenCL

IDE: Vi/Vim, Eclipse

Type Setting: LaTeX

ACADEMIC ACTIVITIES AND SERVICES

Resident Advisor	Fall 2015 – Present
Lab Assistant and Grader, *Physics Department*	Fall 2013 – Spring 2015
Academic Tutor, *Academic Success Office*	Fall 2013 – Present
Lab Assistant, *J.B Fuqua Computing Center*	Fall 2013 – Fall 2014
Student Assistant, *Study Abroad Office*	Fall 2013 – Present
Editor, *HSC Journal of the Sciences*	Fall 2013 – Present
President, *Math/CS Club*	Fall 2013 – Spring 2014
Social Chair, *Circle K International*	Fall 2012