LINH V. NGUYEN

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EDUCATION

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

RESEARCH INTERESTS

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

RESEARCH EXPERIENCES

Principal Investigator, *Independent Study* January 2015 – Present
Hampden-Sydney College, VA

Developing a Parallel Computing course at Hampden-Sydney (in progress)

- Initiated and raised $3000 to build a 8-node Parallella cluster.
- Lead another student in constructing and benchmarking the system.
- Work with two Computer Science professors to develop the curriculum for the course.

Research Assistant, *Laboratory for Computer Architecture at Virginia (LAVA Lab)* May 2014 – Present
University of Virginia, Charlottesville

1. Accelerating HotSpot (HS), a thermal package for architectural studies (completed)
   - Ported CUDA solver to the most recent version of HS, achieving up to 60X speedup without memory transfer overhead.
   - Wrote HS benchmark for 3D ICs in CUDA and ported to OpenMP and OpenCL. Optimized via caching.
2. Variable-length encoding on the GPUs (in progress)
   - Improved a CUDA encoder for large input size by partitioning input and merging results. Input limited only to physical memory.
   - Expanded the encoder to work with 256-bit codewords instead of 32-bit.
   - Built a complete application with realistic Huffman tree by implementing a parallel histogram.
   - 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 Research Program* Summer 2013
Hampden-Sydney College, VA

An attempt to model Rydberg atom (completed)

- Implemented RK4 method to solve a set of coupled first-order differential equations.
- Modelled an atomic potential and the wavefunction propagations with Ehrenfest Theorem.

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
- 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

TECHNICAL EXPERIENCE

Projects

- Compiler (in progress). A gcc-style compiler for the C language. The compiler supports procedures, expressions, and data types. Developed in Java.
- Social Network (in progress). 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

RELEVANT COURSEWORK

COMS480: Advanced Topics in Computer Science. Compiler Design. (in progress)

COMS410: Operating Systems. (in progress)

COMS361: Computer Organization.

COMS262: Computer Science II. Data Structures.

MATH495: Quantum Computing.

MATH444: Complex Analysis. (in progress)

MATH242: Calculus III.

MATH231: Linear Algebra.

MATH490: Partial Differential Equations.

PHYS442: Quantum Mechanics.

PHYS332: Electricity and Magnetism.

PHYS331: Classical Mechanics.

PHYS234: Mathematical Methods for Physics.

PHYS233/235: Modern Physics with Laboratory.

COLLEGE ACTIVITIES AND SERVICES

Lab Assistant and Grader, *Physics Department* Fall 2013 – Present

- Set up weekly pre-laboratories for about 60 students in 2 General Physics classes.
- Grade homework assignments for more than 80 students in General Physics and Meteorology classes.

Academic Tutor, *Academic Success Office* Fall 2013 – Present

- Provide helps with homework assignments and general questions in Economics, Mathematics, Physics, Statistics, and Computer Science.
- Work 10-12 hours and help 5-10 students a week.

Lab Assistant, *J.B Fuqua Computing Center* Fall 2013 – Fall 2014

- Provided general walk-in help with using software and operating systems.

Student Assistant, *Study Abroad Office* Fall 2013 – Present

- Led international student orientation in August 2013.
- Research and maintain international scholarship database.

Editor, *HSC Journal of the Sciences* Fall 2013 – Present

- Collect and edit 3-5 articles per year for publication.

President, *Math/CS Club* Fall 2013 – Spring 2014

Social Chair, *Circle K International* Fall 2012

REFERENCES

Dr. Kevin Skadron, Professor and Chair, Department of Computer Science, University of Virginia.
Email: skadron@cs.virginia.edu

Dr. Paul Hemler, Professor, Department of Mathematics/Computer Science, Hampden-Sydney College.
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Dr. Hugh O. Thurman III, Associate Professor, Department of Physics, Hampden-Sydney College.
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