Robert Underwood

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github.com/robertu94

Education

Clemson University **Clemson, SC**
PhD of Science in Computer Science, GPA 4.0/4.0 *expected*

Clemson University **Clemson, SC**
Master of Science in Computer Science, GPA 4.0/4.0 *May 2018, expected*
Concentration: Systems and Implementation

Clemson University, Calhoun Honors College **Clemson, SC**
Bachelor of Science in Computer Science, GPA 4.0/4.0 *December 2016*
Honors Thesis: Automation in the Classroom

Research

Clemson University **Clemson, SC**
Clemson Data Intensive Computing Environments *2016*

- Designed experiments to analyze performance of high performance computing systems
- Analyzed and modeled latency variation in Ethernet and Infiniband

Clemson University **Clemson, SC**
Clemson PERSIST Lab *2015-2016*

- Designed and developed an automated grading framework using Python, C, Raspberry Pi, and Docker.
- System used modular design, supports process isolation, and multiple test formats.

Relevant Coursework

Clemson University **Clemson, SC**
CPSC 827: Language Translation *Fall 2016*

- Implemented a subset of Python from a yacc-able version of the full Python 2.7 grammar in C++, flex, and bison
- Included: a.s.t. generator; type system; function, global, nested, and returning scope; and primitive exceptions
- Designed and implemented using Object Oriented principals with 55 classes, over 3600 SLOC, in less than 2 months

Clemson University **Clemson, SC**
CPSC 820: Parallel Architecture *Fall 2016*

- Studied hardware and software iterations that facilitate parallel and distributed computation
- Researched and presented on the design and implementation of Linux Bridge, OpenVSwitch, DPDK, SRIOV, and MACVLAN
- Designed and conducted experiment to quantify latency variation in RDMA using InfiniBand layers 1, 2, and 4

Clemson University **Clemson, SC**
CPSC 822: Case Study in Operating Systems: Linux *Spring 2016*

- Designed and developed:
  - Graphics driver for an AMD Radeon-like device with frame buffer, fifo, and dma interfaces
  - System call to unconditionally kill a process
  - Disk scheduler for a SCSI disk controller
- Analyzed and debugged performance issues in the Linux kernel
- Worked with a complex system with limited documentation

Clemson University **Clemson, SC**
CPSC 840: Design and Analysis of Algorithms *Spring 2016*

- Analyzed and designed amortized, randomized, and approximation algorithms to solve problems.
- Designed time and space efficient data structures

Work Experience

The Boeing Company **Charleston, SC**
Information Technology Intern *Summer 2016*

- Developed improvements for a web based portal system in HTML, Python, and JavaScript
- Developed the user interface for a materials database using HTML and JavaScript
- Designed, developed, and led development on a resource management tool using C#, HTML, and JavaScript.

Unitrends, Inc **Columbia, SC**
Software Development Intern *2014-2016*

- Developed GPU offloading for AES encryption using Nvidia CUDA.
- Designed and developed automated configuration scripts for testing environments using Ansible.
- Designed and developed new cloud infrastructure using LVM, Linux, and Docker
- Designed and developed a Dynamic Alert System in Python
- Worked on the Alerts System in PHP, BASH, C, PERL
- Worked on the internal Customer Incident Analysis web portal using Django, Postgreql, HTML, CSS, and JavaScript

Extracurricular Activities

Clemson University **Clemson, SC**
Clemson Association for Computing Machinery Vice President *2014-2016*

- Planned and help found the Clemson Association for Computing Machinery Technology Seminar, Fall 2016
- Prepared and presented 4 seminars per semester on Git, Linux, Vim, Firewalls, Unix tools, and other topics, 2014-2016
- Coordinated with President to set up professional development and social events, 2014-2016
- Assisted with semester planning and manage Clemson Association for Computing Machinery calendar, 2014-2016
- Prepared and presented to School of Computing faculty on automation in the classroom, April 2016.

Clemson University **Clemson, SC**
Clemson Association for Computing Machinery Programming Team *2013-2016*

- Competed in competitions to design efficient algorithms to solve problems
- Team placed 1^{st} at the Mercer Spring Programming Competition in 2014 and 2015
- Team placed 3^{rd} at Association for Computing Machinery Southeast Regional Competition 2015
- Invited to participate in the National Invitational Programming Competition 2015, 2016
- Primary developer for the Clemson Hackpack algorithms reference
- Student apprentice judge at Mercer Programming Competition February 2016.

Clemson University **Clemson, SC**
Clemson University Cyber Security Team *2015-2016*

- Competed in Collegiate Cyber Defense Competition 2015-2016
- Competed in Palmetto Cyber Defense Competition, 2015
- Primary developer for the Cyber Security reference material, 2016
- Designed and developed scripts to aid in auditing and administration of contest environments, 2016
- Lead training on:
  - Exploitable patterns in software design and how to mitigate them
  - User (strace, ltrace, lldb) and system (systemtap, dtrace) tracing tools for program analysis.

Presentations

Automation in the Classroom: Motivation and demonstration of classroom automation
C++ Templates: Staring into the Abyss: Advanced talk on C++11-17 templates and uses
Dockerize all the Things!: Introduction to container technology and uses
Exploitable II: Application Design: Overview of writing secure software
Exploitable: Ethical Hacking: Introduction to ethical software penetration testing
Git Well Soon: Introduction to the Git distributed version control system
Intermediate Vim: Advanced seminar on using the Vim text editor
Linux is Scary: Introduction to Linux for new computer science students
N Unix Tools in $O(N)$ Minutes: Overview of scripting tools for POSIX platforms
NMAP: Overview of network mapping with NMAP
Provisioning At the Speed of Thought: Evaluation and Uses of Ansible, Salt and Puppet
Python: A Parser Tongue Primer: Introduction to idiomatic Python programming
Think Different: Introduction to approaching computer science projects
Thou Shall Not Pass: Introduction to open source firewalls
Writing Semantic Code: Using refactoring and design patterns for better code

Computer Skills

Advanced: Bash, Bourne Shell, C, C++, Docker, Linux Kernel and Userspace, Python, Vim
Intermediate: Ansible, Git, Hadoop, JAVA, JavaScript, LaTeX, SaltStack, Systemd, SQL
Basic: ARM assembly, C#, FreeBSD, MPI, PHP, Perl, Puppet, SNMP, SVN, Apache Spark

Professional Affiliations

Association for Computing Machinery: Student Member 2014-2017

Professional Service

Reviewer: ICPE 2017, ICCCN 2017, PBAS 2017

Honors

- Eagle Scout 2010
- Order of the Arrow, Vigil Honor 2013
- President's List at Clemson University 2013-2016
- Outstanding Sophomore in Computer Science at Clemson University 2015
- Palmetto Fellows Recipient 2013-2016
- McAlister Scholarship 2015-2016
- Benefitfocus Scholarship 2015-2016
- Faculty Scholarship Award, Clemson University 2016
- National Science Foundation Graduate Research Fellowship Honorable Mention 2017
- Graduate Fellowship, National Research Traineeship: Resilient Infrastructure Systems