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   *2016-2017*

o Design experiments to analyze performance of high performance computing systems
o Analyzed and modeled latency variation in Ethernet and Infiniband
o Build models to improve reliability computer infrastructure.

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

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

Relevant Coursework

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

o Implemented a subset of Python from a yacc-able version of the full Python 2.7 grammar in C++, flex, and bison
o Included: a.s.t. generator; type system; function, global, nested, and returning scope; and primitive exceptions
o 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*

o Studied hardware and software iterations that facilitate parallel and distributed computation
o Researched and presented on the design and implementation of Linux Bridge, OpenVSwitch, DPDK, SRIOV, and MACVLAN
o 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*
- o 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
- o Analyzed and debugged performance issues in the Linux kernel
- o Worked with a complex system with limited documentation

Work Experience

The Boeing Company   **Charleston, SC**
Information Technology Intern   *Summer 2016, 2017*
- o Developed improvements for a web based portal system in HTML, Python, and JavaScript
- o Developed the user interface for a materials database using HTML and JavaScript
- o Designed, developed, and led development on a resource management tool using C#, HTML, and JavaScript.
- o Worked on the Network Automation, Tooling, and Standards Integration Team

Unitrends, Inc   **Columbia, SC**
Software Development Intern   *2014-2016*
- o Developed GPU offloading for AES encryption using Nvidia CUDA.
- o Designed and developed automated configuration scripts for testing environments using Ansible.
- o Designed and developed new cloud infrastructure using LVM, Linux, and Docker
- o Designed and developed a Dynamic Alert System in Python
- o Worked on the Alerts System in PHP, BASH, C, PERL
- o Worked on the internal Customer Incident Analysis web portal using Django, Postgreql, HTML, CSS, and JavaScript

Extracurricular Activities

Clemson University   **Clemson, SC**
Clemson School of Computing Graduate Student Organization, Secretary   *2017*
- o Keep minutes and assist with program and logistics
- o Coordinate with other student organizations and School of Computing staff

Clemson University   **Clemson, SC**
Clemson Association for Computing Machinery Vice President   *2014-2016*
- o Planned and help found the Clemson Association for Computing Machinery Technology Seminar, Fall 2016
- o Prepared and presented 4 seminars per semester on Git, Linux, Vim, Firewalls, Unix tools, and other topics, 2014-2016
- o Coordinated with President to set up professional development and social events, 2014-2016
- o Assisted with semester planning and manage Clemson Association for Computing Machinery calendar, 2014-2016
- o 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 1st at the Mercer Spring Programming Competition in 2014 and 2015
- Team placed 3rd 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 *2015-2017*
- 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

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