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Objective: To find an internship that provides opportunities for academic growth and important, cutting-edge research that complements and enhances my knowledge of Operating Systems and Virtual Execution Environments.

#### Education:

University of Virginia, Ph.D. Student, Computer Science 2008-Present

Anticipated Graduation - 2011

Courses:

Computer Organization, Programming Languages

Emory University, M.S., Computer Science 2006-2008

Final GPA – 3.7

Courses:

Compiler Construction, Database Systems, Systems Programming, Operating Systems, Natural Language Processing, Parallel Processing, Theory of Computing, Computer Graphics, Algorithms

Longwood University, B.S., Computer Science and Math 2002-2006

Final GPA – 3.8

Relevant Courses:

Computer Organization and Assembler Language Programming, Computer Organization, Organization of Programming Languages, Introduction to Operating Systems and Computer Architecture, Object-Oriented Programming, Computer Network Theory, Theory of Databases, Artificial Intelligence, Software Engineering, Queuing Theory and Simulation

Honors, Awards, and Scholarships:

- Summa Cum Laude
- Longwood Honors
- Badger-Magnifico Award for Excellence in Computer Science
- Mary Lewis Allen Scholarship for Computer Science
- AGL Resources Scholarship for Academic Excellence
- President's List x4
- Dean's List x3

#### Programming Languages, Software Proficiencies:

C/C++, x86 Assembly, Java, LATEX, OCAML, FORTRAN, OpenGL, and SQL

Microsoft Windows, MS-DOS, and Linux operating systems

Microsoft Office and OpenOffice.org office suites

#### Research Projects and Independent Studies:

Fall '08 – Present Research Assistantship

Dynamic Code Cache Management to Improve Dynamic Binary Instrumentation Performance

Some previous work has uncovered an anomaly in the performance of some benchmark programs wherein a program's performance while instrumented will improve when the size of the virtual code cache is limited. We seek to take advantage of this behavior using adaptive techniques to monitor the code cache and flush out old data when it becomes cumbersome.

Advisor: Kim Hazelwood, Assistant Professor, University of Virginia

Key Topics: Virtual Machines, Memory Management, Adaptive Execution

## Research Projects and Independent Studies (cont.):

Summer '08 – Fall '08                      Research Assistantship

Effects of Dynamic Binary Instrumentation on Hardware Branch Prediction

Dynamic Binary Instrumentation (DBI) tools often utilize a virtual code cache in their execution, in which traces of a program are extracted and recompiled, often with some instrumentation code or optimizations. This behavior is quite different from the standard execution environment that CPUs are generally designed for, which can cause a substantial impact on the performance of hardware components like the branch predictor. This project studied this impact in detail for two such DBIs, Pin and DynamoRIO.

Advisor: Kim Hazelwood, Assistant Professor, University of Virginia

Key Topics: Architecture, Virtual Machines, Workload Characterization

Spring '08    Independent Study

HOCA: Operating System Design on x86

A graduate-level computer science curriculum often includes a course in Operating System design, in which a student will implement a small Operating System over the course of a semester in order to learn about the more intricate details of OS design. As technology advances, so too must the design of these academic Operating Systems to reflect those advancements. In this project, we studied the current technology available for such an update, and began the transition from a Motorola 68000 simulator to an x86 virtual machine.

Advisor: Dr. Ken Mandelberg, Associate Professor, Emory University

Key Topics: Operating Systems, Architecture, Software Engineering

Summer '07 – Spring '08                      Research Assistantship

EDIT: Extensible Data Identification Toolkit

In the medical community, there is a vast amount of unstructured data available in the reports that physicians must maintain throughout day to day activities. This data goes largely unutilized by the research community for two primary reasons: 1) the format of the data is nonstandard between institutions, and 2) the data is scattered across the globe in medical records vaults where no one but local personnel can access them. EDIT is designed to overcome these two hurdles by providing a simple interface for researchers to automatically convert data to a searchable, semi-structured format, and then share this data in a secure but accessible manner to the rest of the research community.

Advisor: Dr. James Lu, Associate Professor, Emory University

Key Topics: Natural Language Processing, Security, Software Engineering, Bio-Informatics

Summer '05    NSF Research Experience for Undergraduates

Computer Science Applications for Medicine

The rapid worldwide deployment of the Internet and Web is the enabler of a new generation of e-healthcare applications, but the provision of a security architecture that can ensure the privacy and security of sensitive healthcare data is still an open question. This project made use of web services and biometric (fingerprint, iris scan, signature recognition) and digital (e-token, RFID, PIN generators) approaches to security.

Advisor: Dr. Alfred Weaver, Professor, University of Virginia

Key Topics: Security, Web Services, Bio-Informatics

Spring '05    Independent Study

Designing an Automatic Graphics API for Introductory Computer Science Classrooms

Computer Science educators are constantly looking for new ways to utilize technology in the pursuit of helping students learn the concepts needed for success. Even simple ideas can be difficult for students to comprehend without some form of visual aide. To solve this problem, we designed and implemented a simple programming API whereby visualizations can be added to an educators programming examples to display control graphs, memory contents, and data structures as the program executes.

Advisor: Dr. Jeffery Peden, Associate Professor, Longwood University

Key Topics: Graphics, Computer Science Education, Human-Computer Interaction

## Work Experience:

Fall '06 - Spring '07                      Laboratory Assistant  
Supervisor: Sebastien Siva, Dept. of Computer Science, Emory University

### Responsibilities:

- Overseeing student computing lab operations during academic terms.
- Providing programming and system support to students.
- Upholding lab policies and ensuring lab security.

Spring '03 - Fall '04                      Resident Technical Associate  
Supervisor: Kim Redford, User Support Services, Longwood Univ.

### Responsibilities:

- In-house maintenance and upkeep of approximately 200 student computers.
- Student training on various technological issues, including virus/malware protection, computer maintenance, and software use.
- On-call technological support for faculty/staff at University Help-Desk.
- Development and maintenance of software for Help-Desk and RTA service records, assignments, and statistical reports.

Winter '01 - Spring '04                  Computer Service Technician  
Supervisor: Jerry Vess, Owner, ACME Computer Services, Aylett VA

### Responsibilities:

- In-house maintenance and system repair for both personal and corporate clients between academic terms.
- Building and repairing custom hardware and software systems.
- Consultation and implementation of computational and network system solutions.

## References:

Dr. Kim Hazelwood (434) 982-2228  
Assistant Professor of Computer Science, University of Virginia

Dr. James Lu (404) 712-8638  
Associate Professor of Computer Science, Emory University

Dr. Ken Mandelberg (404) 727-7963  
Associate Professor of Computer Science, Emory University

Dr. Alfred Weaver (434) 982-2201  
Professor of Computer Science, University of Virginia

Dr. Jeffery Peden (434) 395-2196  
Associate Professor of Computer Science, Longwood University