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## Interests

My research interests are in the **mobile** and **distributed** computing space to enable next-generation mobile applications.

## Education

Carnegie Mellon University  
Ph.D. Student, Computer Science.

Pittsburgh, Pennsylvania  
*Starting August 2014*

Virginia Tech  
B.S., Computer Science, Honors Scholar. GPA: 3.99/4.00

Blacksburg, Virginia  
*August 2011–May 2014*

## Research Experience

Magnum Research Group

Undergraduate Research Assistant, **Advisor:** Dr. Jules White

Blacksburg, Virginia  
*May 2012–January 2014*

- Work supported with ARO REU grant.
- Android **malware detection research** resulting in primary authorship on a conference publication.
- Led a small team to create a distributed **Actor** system in **Scala** for **machine learning** classification of APKs.
- Developed **VC#** and **Python** programs for a pilot study on manufacturing cyber-physical security.
- Assisted **C++** and **Make** development in **Linux** for a deployment optimization framework.
- Modified the **Android source** to provide non-standard logging information for dynamic malware analysis.

Virginia Tech Computer Science

Undergraduate Research Assistant, **Advisor:** Dr. Layne Watson

Blacksburg, Virginia  
*January 2013–May 2014*

- Algorithm development for stochastic optimization using quasi-Newton methods for parameter estimation in **Fortran 95** and **OpenMP** resulting in primary authorship on a conference publication.
- Bioinformatics research on yeast cell modeling using **Fortran 95**, **C++**, and **Matlab**.

Systems Software Research Group

Undergraduate Research Assistant, **Advisor:** Dr. Binoy Ravindran

Blacksburg, Virginia  
*November 2012–March 2014*

- Work supported with NSF and NEEC REU grants.
- Research on automatic **OpenMP** to **CUDA** translation using **C++** and the **ROSE** compiler framework.
- Polyhedral loop optimization research to restructure **OpenCL** kernels for locality using **LLVM** and **Polly**.
- **Scala** and **Bash** development in **Linux**.

## Teaching Experience

Virginia Tech Computer Science

Undergraduate Teaching Assistant

Blacksburg, Virginia  
*January 2013–May 2013*

- Assisted students in a software design and data structures class using **Java** and **Android**.

# Publications

## Conference Proceedings.

- [1] T. Andrew, B. Amos, D. Easterling, C. Oguz, W. Baumann, J. Tyson, and L. Watson, “Global parameter estimation for a eukaryotic cell cycle model in systems biology,” in *2014 Summer Simulation Multiconference, Society for Modeling and Simulation International*, 2014.
- [2] B. Amos, D. Easterling, L. Watson, B. Castle, M. Trosset, and W. Thacker, “Fortran 95 implementation of qnstop for global and stochastic optimization,” in *2014 Spring Simulation Multiconference, 22nd High Performance Computer Symposium, Society for Modeling and Simulation International*, 2014.
- [3] B. Amos, H. Turner, and J. White, “Applying machine learning classifiers to dynamic android malware detection at scale,” in *IWCMC’13 Security, Trust and Privacy Symposium*, 2013.

## Articles.

- [4] H. Turner, J. White, B. Amos, J. Camelio, C. Williams, and R. Parker, “Bad parts: are our manufacturing systems at risk of silent cyber-attacks?” *IEEE Security and Privacy Magazine*, to appear.

# Industry Experience

## Adobe Research

San Jose, California

### Data Scientist Intern

May 2014–August 2014

- Distributed systems research on building and benchmarking a web analytics processing engine with **Scala**, **Spark**, **Spray**, and **Parquet**.
- Released 3 open source projects on the Adobe Research GitHub page and submitted a conference paper.

## Snowplow Analytics

London, United Kingdom (Remote)

### Software Winter Intern

December 2013–January 2014

- Open-source **Scala** development with a startup on the Snowplow analytics platform.
- Developed a new server using **Spray** and **Actors** to store **Apache Thrift** events on **Amazon Kinesis**.
- Completed project ahead of schedule, and also helped port Snowplow’s Scala enrichment process to Kinesis.

## Qualcomm

San Diego, California

### Source Integrity Team Software Intern

May 2013–August 2013

- Developed a **web application** to modify an XML-based grammar for fuzz vector generation. Implemented with client-side **HTML** and **js**, using **D3** for graphics and **Handlebars** for templating.
- Developed an XML-based grammar translator in **C++** with the **Xerces** XML parser in **Linux**. Reimplemented in **Python** using the **ElementTree** XML API for better analysis and tree transformation.

## Phoenix Integration

Blacksburg, Virginia

### Software Engineer Intern

May 2012–August 2012

- Integrated a new licensing mode into CenterLink, a grid computing application, using **FLEXlm** and **Java**.
- Assisted development of industry software in **VC++**, **VC#**, **Java**, and **Tomcat**.
- Improved the testing (**JUnit** and **NUnit**) and installation (**Ant**, **InstallShield**, and **Make**) frameworks.

## Sunapsys

Vinton, Virginia

### Network Administrator Intern

January 2011–August 2011

- Internship in high school with a small local company to replace Windows domain, mail, DHCP, and DNS servers with virtualized **Linux** servers.
- Fully developed the servers and successfully migrated all of the office’s computers.
- Created **Bash** scripts to provide incremental backups.

# Projects

GitHub Portfolio – <http://github.com/bamos>

- Hosts code samples, original source code, and patches for open source projects.
- 23 original repositories, 7 forked repositories.

Personal Blog and Website – <http://bamos.io>

- Hosted on GitHub Pages. Uses **Markdown** for posts and **Jekyll** for static HTML generation.
- **40 posts** across the following tags, listed by highest frequency.
- Python, Bash, Linux, L<sup>A</sup>T<sub>E</sub>X, Fortran, Scala, Android, JavaScript, Zsh, CUDA, News, OpenMP, C++, Mathematica, mpv, Lua

# Skills

- **Preference.** Mac, vim, git, Make, sbt
- **Languages.** Akka\*\*, Bash\*\*, C/C++\*\*, C#\*, Fortran\*\*, HTML/CSS\*, L<sup>A</sup>T<sub>E</sub>X\*\*, Java\*\*, JavaScript\*\*, *Mathematica*\*\*, Make\*\*\*, PHP\*, Python\*\*\*, R\*, Scala\*\*\*
- **Systems.** Android\*\*, Linux\*\*\*, Mac\*\*\*
- **Rankings.** 1/10\* – 3/10\*\* – 5/10\*\*\* – 7/10\*\*\*\*

# Honors & Awards

- Phi Beta Kappa Honor Society, Inducted 2014
- 1st Place Capstone Award, Virginia Tech Computer Science, 2014
- David Heilman Research Award, Virginia Tech Computer Science, 2014
  - Given to the Computer Science student with the most outstanding research experience.
- Senior Scholar Award, Virginia Tech Computer Science, 2014
  - Given to the senior in Computer Science with the most outstanding academic record.
- ACC Meeting of the Minds Undergraduate Research Conference, 2014
- Honorable Mention, CRA Outstanding Undergraduate Researcher Award, 2014
  - 1 of 15 North American males awarded honorable mention for exemplary computer science research.
- Qualstar Award, Qualcomm, 2013
- Pi Mu Epsilon Honor Society, Inducted 2013
- Benjamin F. Bock Merit Scholarship, Virginia Tech Engineering, 2013–2014
- Sophomore Scholar Award, Virginia Tech Computer Science, 2013
- University Honors, Virginia Tech, 2012–2014
- Intelligence Community Center of Academic Excellence Scholar, Virginia Tech, 2012–2014
  - Merit-based scholarship providing a cyber-security research fellowship.
- Dean's List with Distinction, Virginia Tech, 2011–2014
- Engineering Merit Scholarship, Roanoke County Public Schools Education Foundation, 2011
  - Merit-based scholarship presented annually to one student in the graduating Engineering class.
- Papa John's Merit Scholarship, 2011
- Gay B. Shober Memorial Merit Scholarship, Roanoke County Federal Credit Union, 2011
- Pamplin Leader Scholarship, Virginia Tech, 2011
  - Merit-based scholarship presented to one student from each public high school in Virginia.
- I. Luck Gravett Memorial Merit Scholarship, Scottish Rite of Freemasonry, 2011
- Salem–Roanoke County Chamber of Commerce Merit Scholarship, 2011

# Activities

- Honors Residential College, Virginia Tech, 2013–2014
- Hokies Pep Band, Virginia Tech, 2012–2013
- Computer Science Community Service, Virginia Tech, 2012
- Symphony Band, Virginia Tech, 2011–2012
- Linux and Unix Users Group, Virginia Tech, 2011–2012
- Galileo Living–Learning Community, Virginia Tech, 2011–2012
- Trumpet Section Leader, Marching Band, Northside High School, 2010–2011
- Tennis Team, Northside High School, 2008–2011