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Interests

My research interests are currently in the **mobile** and **distributed** computing space to provide enabling technology for next-generation mobile applications.

Education

Carnegie Mellon University — Pittsburgh, Pennsylvania
Ph.D. Student, Computer Science. — *Starting August 2014*

Virginia Tech — Blacksburg, Virginia
B.S., Computer Science, Honors Scholar. GPA: 3.98/4.00 — *August 2011–May 2014*

Research Experience

Virginia Tech Computer Science — Blacksburg, Virginia
Undergraduate Research Assistant, **Advisor**: Dr. Layne Watson — *January 2013–Present*

- 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 — Blacksburg, Virginia
Undergraduate Research Assistant, **Advisor**: Dr. Binoy Ravindran — *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**.

Magnum Research Group — Blacksburg, Virginia
Undergraduate Research Assistant, **Advisor**: Dr. Jules White — *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.

Teaching Experience

Virginia Tech Computer Science — Blacksburg, Virginia
Undergraduate Teaching Assistant — *January 2013–May 2013*

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

Publications

Conference

1. "Fortran 95 implementation of QNSTOP for global and stochastic optimization." **Brandon Amos**, David Easterling, Layne Watson, Brent Castle, Michael Trosset, William Thacker. SpringSim'14 High Performance Computing Symposium. Tampa, Florida, USA, April 2014.
2. "Applying machine learning classifiers to dynamic Android malware detection at scale." **Brandon Amos**, Hamilton Turner, Jules White. IWCMC'13 Security, Trust, and Privacy Symposium. Cagliari, Italy, July 2013.

Submitted

1. "Global Parameter Estimation for a Eukaryotic Cell Cycle Model in Systems Biology." Tricity Andrew, **Brandon Amos**, David Easterling, Cihan Oguz, William Baumann, John Tyson, Layne Watson.
2. "Cyber Security and Industrial Manufacturing: Toward a Future of Trusted Manufacturing." Hamilton Turner, **Brandon Amos**, Jules White, Robert Parker, Christopher Williams, Jaime Camelio.
3. "Bad Parts: Are Our Manufacturing Systems At Risk of Silent Cyber-attacks?" Hamilton Turner, **Brandon Amos**, Jules White, Jaime Camelio, Chris Williams, Robert Parker.

Industry Experience

Adobe Research — San Jose, California

Data Science Intern — *May 2014–August 2014*

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.

Skills

- **Preference.** Linux, vim, git, Make, sbt
- **Languages.** Akka**, Bash**, C/C++**, C#*, Fortran**, HTML/CSS*, LaTeX**, Java**, JavaScript**, *Mathematica*, Make***, PHP*, Python***, R*, Scala***
- **Systems.** Android**, Linux***
- **Rankings.** 1/10* – 3/10** – 5/10*** – 7/10****

Honors & Awards

- Senior Scholar Award, Virginia Tech Computer Science, 2013
  - 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
- 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, 2011–2013
- 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

Projects

Personal Blog and Website – `http://bamos.io`

- Hosted on GitHub Pages. Uses **Markdown** for posts and **Jekyll** for static HTML generation.
- **37 posts** across the following tags, listed by highest frequency.
- Python, Bash, LaTeX, Scala, Linux, Fortran, JavaScript, Android, News, CUDA, OpenMP, C++, Mathematica

GitHub Portfolio – `http://github.com/bamos`

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

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