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http://bamos.github.io

Interests

Compiler, **mobile**, or **security** research in a **Linux** environment.

Education

Virginia Polytechnic Institute and State University — Blacksburg, Virginia
B.S. Computer Science — **August 2011 – May 2014**
- **Overall GPA:** 3.98/4.00 — **Major GPA:** 4.00/4.00
- **Courses:** Software Design, Data Structures, Numerical Methods, Cryptography, Computer Organization
- **Course Projects:** AES-128 (**Java**), MIPS assembler (**C**), PR Quadtree (**Java**)

Research Experience

Virginia Tech Computer Science Department — Blacksburg, Virginia
Undergraduate Research Assistant — **January 2013 – Present**
- Implement quasi-Newton stochastic optimization algorithm in **Fortran 95**.
  Specific libraries used include **BLAS** and **LAPACK**.

Systems Software Research Group — Blacksburg, Virginia
Undergraduate Research Assistant — **November 2012 – Present**
- Work supported with NSF and NEEC REU grants.
- Source-to-source compiler research on OpenMP to CUDA translation. Specifically, developed a compiler in **C++** with the **ROSE** compiler framework for automatic OpenMP to CUDA translation.
- Assisted development with runtime execution prediction. Created **Scala** scripts to parse raw data for feature vectors to be used by **WEKA**'s machine learning algorithms.
- Developed **Bash** scripts to automate benchmarking on heterogeneous hardware.

Magnum Research Group — Blacksburg, Virginia
Undergraduate Research Assistant — **May 2012 – Present**
- Work supported with Northrup Grumman and ARO REU grants.
- Android **malware detection research** resulting in primary authorship on a conference publication.
- Implemented a framework with **Bash** scripts to dynamically profile APKs and analyze popular machine learning algorithms with **WEKA**. Reimplemented framework in **Scala** with **Actors** for scalability.
- Developed **VC#** programs for a pilot study on manufacturing cyber-physical security.
- Assisted **C++** and **Make** development for a deployment optimization framework.
  Specific libraries used include **TCLAP** and **rapidxml**.
- Corresponded with another research group and modified the **Android source** to provide non-standard logging information for dynamic malware analysis. Configured a **Gerrit** server to host code review.

Industry Experience

Qualcomm, Inc. — 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.
- Developed an XML-based grammar translator in **C++** with the **Xerces** XML parser.
  Reimplemented in **Python** using the **ElementTree** XML API for better analysis and tree transformation.

Phoenix Integration, Inc. — Blacksburg, Virginia
Software Engineer Intern — **May 2012 – August 2012**
- Integrated a new licensing mode into CenterLink via **FLEXlm** and **Java**.
- Fulfilled bug fixes and feature requests in **VC++**, **VC#**, and **Java**.
- Improved the testing (**JUnit** and **NUnit**) and installation (**Ant**, **InstallShield**, and **Make**) frameworks.
- Migrated the web server of CenterLink, a grid computing application, from Tomcat 5 to Tomcat 7.

Sunapsys, Inc. — Vinton, Virginia
Network Administrator Intern — **January 2011 – August 2011**
- Configured virtualized DHCP, DNS, and PDC servers in **Linux** to replace existing Windows servers.
- Created **Bash** scripts to back up data incrementally and monitor the status of the servers.

Teaching Experience

Virginia Tech Computer Science Department — Blacksburg, Virginia
Undergraduate Teaching Assistant — **January 2013 – May 2013**
- Assisted students in a software design and data structures class using **Java** and **Android**.

Publications

- "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.

Skills

- **Environments**: Eclipse**, NetBeans*, vim/gdb***, Visual Studio**
- **Frameworks**: Drupal*, .NET*, ZK*
- **Languages**: Bash**, C/C++**, C#*, Fortran**, HTML/CSS*, LaTeX**, Java***, JavaScript**, *Mathematica*****, PHP*, Python***, R*, Scala**
- **Software**: i3wm**, Make**, Ratpoison**, Samba**, Tomcat*, Zimbra*
- **Systems**: Android**, Linux***, Windows*
- **Version Control/Review**: Gerrit*, Git***, Subversion**

Exposure* – Minimal knowledge** – Adequate knowledge*** – Maximum knowledge****

Projects

Personal Blog and Website – http://bamos.github.io **July 2012 – Present**

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

GitHub Portfolio – http://github.com/bamos **April 2011 – Present**

- Hosts code samples, original source code, and patches for open source projects.
- 18 original repositories.
  - dotfiles, latex-templates, mew, parsec-benchmark, reading-list, scala-sorting, simple-fortran-routines, simple-python-scripts, simple-shell-scripts
  - **AES** - An educational Java implementation of AES-128. Includes polynomial inverses in AES' Galois finite field via Euler's extended GCD algorithm and prints the state after each step.
  - **bamos.github.io** - My personal website.
  - **cpp-expression-parser** - Expression parsing in C++ with Dijkstra's Shunting-yard algorithm.
  - **ical-availability** - Analyze your iCals and print your availability.
  - **latex-resume-cv** - My LaTeX resume and CV. Uses Make and produces PDFS and (rough) text versions of my resume and CV from the same LaTeX files.
  - **list-github-repos** - Obtain a LaTeX list of all of a user's public Github repos and descriptions.
  - **mbox-convos** - Export all emails in an mbox mailbox to or from somebody to a PDF.
  - **mutt-mass-mailer** - M3 parses a flat file and uses mutt to email many people different messages.
  - **safegit** - Wraps git to detect sensitive data before commits by using fuzzy Rabin fingerprints.
- 3 forked repositories.
  - antimalware, gv-app, mirror-android-repo

Honors & Awards

- Benjamin F. Bock Scholarship, Virginia Tech Engineering, 2013
- Sophomore Scholar Award, Virginia Tech Computer Science, 2013
  - Given to the sophomore in Computer Science with the most outstanding academic record.
- University Honors, Virginia Tech, 2012–2013
- Intelligence Community Center of Academic Excellence Scholar, Virginia Tech, 2012–2013
  - Merit-based scholarship that provides a security-based research fellowship.
- Dean's List with Distinction, Virginia Tech, 2011–2013
- Engineering Scholarship, Roanoke County Public Schools Education Foundation, 2011
  - Merit-based scholarship presented annually to one student in the graduating Engineering class.
- Papa John's Scholarship, 2011
- Gay B. Shober Memorial Scholarship, Roanoke County Federal Credit Union, 2011
- Pamplin Leader Scholarship, Virginia Polytechnic Institute and State University, 2011
  - Merit-based scholarship presented to one student from each public high school in Virginia.
- I. Luck Gravett Memorial Scholarship, Scottish Rite of Freemasonry, 2011
- Salem–Roanoke County Chamber of Commerce Scholarship, 2011
- Virginia Aerospace Science and Technology Scholar, National Space Grant Foundation, 2010
  - Selected as an attendee of a summer academy at NASA Langley Research Center.

Activities

- Honors Residential College, Virginia Tech, 2013
- 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