brandon amos. vitæ.

Phone. (540) 947–1238 Email. bamos@cmu.edu
http://bamos.io
Generated October 16, 2014.

Research Interests

Mobile computing; distributed systems; computer vision.

Education

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

Virginia Tech — Blacksburg, Virginia
B.S., Computer Science, Honors Scholar. GPA: 3.99/4.00 — *August 2011–May 2014*

Research Experience

Carnegie Mellon University — Pittsburgh, Pennsylvania
Research Assistant, **Advisor**: Dr. Mahadev Satyanarayanan — *August 2014–Present*

- **Research Area**: Mobile computing and distributed systems.

Magnum Research Group — Blacksburg, Virginia
Undergraduate Research Assistant, **Advisor**: Dr. Jules White — *May 2012–January 2014*

- **Research Area**: Mobile computing, cyber-physical systems, and security.
- Android **malware detection research** resulting in primary authorship on a conference publication. The current **Scala** implementation uses a distributed **Actor** system to obtain run-time feature vectors to train **machine learning** classifiers.
- Modified the **Android source** to provide non-standard logging information for dynamic malware analysis.
- 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.

Virginia Tech, Computer Science — Blacksburg, Virginia
Undergraduate Research Assistant, **Advisor**: Dr. Layne Watson — *January 2013–May 2014*

- **Research Area**: Scientific computing.
- Algorithm development for stochastic optimization using quasi-Newton methods for **parameter estimation** in **Fortran 95** and **OpenMP**.
- 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*

- **Research Area**: Compilers.
- Compiler research on a heterogenous system 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

- Undergraduate TA. **CS 2114, Software Design and Data Structures**. Virginia Tech. *January 2013–May 2013*.

Publications

Conference Proceedings.

[C1] W. Hu, **B. Amos**, Z. Chen, K. Ha, W. Richter, P. Pillai, B. Gilbert, J. Harkes, M. Satyanarayanan, "The case for offload shaping," submitted.

[C2] **B. Amos** and D. Tompkins, "Performance study of spindle, a web analytics query engine implemented in spark," in *Proceedings of the 2014 IEEE International Conference on Cloud Computing Technology and Science (CloudCom), Big Data Track*, 2014.

[C3] T. Andrew, **B. Amos**, D. Easterling, C. Oguz, W. Baumann, J. Tyson, 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.

[C4] **B. Amos**, D. Easterling, L. Watson, B. Castle, M. Trosset, 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.

[C5] **B. Amos**, H. Turner, J. White, "Applying machine learning classifiers to dynamic android malware detection at scale," in *IWCMC'13 Security, Trust and Privacy Symposium*, 2013.

Journal Articles.

[J1] **B. Amos**, D. Easterling, L. Watson, W. Thacker, B. Castle, M. Trosset, "QNSTOP-QuasiNewton Algorithm for Stochastic Optimization," submitted.

Magazine Articles.

[M1] H. Turner, J. White, **B. Amos**, J. Camelio, C. Williams, 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*

- **Research Area**: Distributed Systems
- Built and released *Spindle*, an open source web analytics processing engine with **Scala**, **Spark**, **Spray**, and **Parquet** on **HDFS**.
- Spindle is available on GitHub at `http://github.com/adobe-research/spindle`.

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, available at `http://github.com/snowplow/snowplow`.
- 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 sophisticated analysis and tree transformations.

Phoenix Integration — Blacksburg, Virginia
Software Engineer Intern — *May 2012–August 2012*

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

Sunapsys — Vinton, Virginia
Network Administrator Intern — *January 2011–August 2011*

- Internship in high school to replace Windows domain, mail, DHCP, and DNS servers with virtual **Linux** servers using **KVM** and **virsh**.
- Successfully created the servers and migrated the office's computers to the Linux servers.
- Created **Bash** scripts for incremental backups with rsync and hard links.

Projects

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

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

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

- Hosts code samples, original source code, and patches for open source projects.
- 25 original repositories, 5 forked repositories.

Skills

- **Preference.** Arch Linux, Mac, 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***, 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