Brandon Amos

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Education

- Ph.D. Student, Computer Science, Carnegie Mellon University — Aug 2014–Present
- B.S., Computer Science, Virginia Tech (3.99/4.00) — Aug 2011–May 2014
- Northside High School (Roanoke, Virginia) — May 2011

Research Experience

- Research Assistant, Carnegie Mellon University — Apr 2016–Present
  - **Advisor**: Prof. Zico Kolter
  - **Area**: Machine learning and optimization
- Research Assistant, Carnegie Mellon University — Aug 2014–Apr 2016
  - **Advisor**: Prof. Mahadev Satyanarayanan
  - **Area**: Machine learning, computer vision, and mobile computing.
  - Face recognition with deep neural networks: `http://github.com/cmusatyalab/openface`
- Undergraduate Research Assistant, Magnum Research Group — May 2012–May 2014
  - **Advisor**: Prof. Jules White
  - **Area**: Mobile computing, cyber-physical systems, and security.
  - Android malware detection research using a distributed **Actor-based Scala** system.
  - Manufacturing cyber-physical security research implemented with **VC#** and **Python**.
- Undergraduate Research Assistant, Virginia Tech — Jan 2013–May 2014
  - **Advisor**: Prof. Layne Watson
  - **Area**: Scientific computing, global/stochastic optimization, and bioinformatics.
  - Algorithm development for global and 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**.
- Undergraduate Research Assistant, Systems Software Research Group — Nov 2012–Mar 2014
  - **Advisor**: Prof. Binoy Ravindran
  - **Area**: Heterogeneous compilers.
  - Compiler research on a heterogeneous 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**.

Publications

Conference Proceedings

[C1] **B. Amos**, H. Turner, J. White, "Applying machine learning classifiers to dynamic Android malware detection at scale," in *IWCMC Security, Trust and Privacy Symposium*, 2013. [Online]. Available: http://bamos.github.io/data/papers/amos-iwcmc2013.pdf.

Workshop, Symposium, and Short Papers

[W1] N. A. J. Davies, N. Taft, M. Satyanarayanan, S. Clinch, **B. Amos**, "Privacy mediators: helping iot cross the chasm," in *HotMobile*, 2016. [Online]. Available: http://eprints.lancs.ac.uk/78255/1/44691.pdf.

[W2] Z. Chen, L. Jiang, W. Hu, K. Ha, **B. Amos**, P. Pillai, A. Hauptmann, M. Satyanarayanan, "Early Implementation Experience with Wearable Cognitive Assistance Applications," in *WearSys*, 2015. [Online]. Available: http://www.cs.cmu.edu/~satya/docdir/chen-wearsys2015.pdf.

[W3] W. Hu, **B. Amos**, Z. Chen, K. Ha, W. Richter, P. Pillai, B. Gilbert, J. Harkes, M. Satyanarayanan, "The Case for Offload Shaping," in *HotMobile*, 2015. [Online]. Available: http://www.cs.cmu.edu/~satya/docdir/hu-hotmobile2015.pdf.

[W4] **B. Amos** and D. Tompkins, "Performance study of Spindle, a web analytics query engine implemented in Spark," in *IEEE CloudCom*, 2014. [Online]. Available: http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7037709.

[W5] 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 *Summer Simulation Multiconference, Society for Modeling and Simulation International*, 2014. [Online]. Available: http://dl.acm.org/citation.cfm?id=2685662.

[W6] **B. Amos**, D. Easterling, L. Watson, B. Castle, M. Trosset, W. Thacker, "Fortran 95 implementation of QNSTOP for global and stochastic optimization," in *Spring Simulation Multiconference, High Performance Computer Symposium, Society for Modeling and Simulation International*, 2014. [Online]. Available: http://dl.acm.org/citation.cfm?id=2663525.

Magazine Articles

[M1] M. Satyanarayanan, P. Simoens, Y. Xiao, P. Pillai, Z. Chen, K. Ha, W. Hu, **B. Amos**, "Edge analytics in the internet of things," *IEEE Pervasive Computing*, no. 2, pp. 24–31, 2015. [Online]. Available: https://www.cs.cmu.edu/~satya/docdir/satya-edge2015.pdf.

[M2] H. Turner, J. White, J. A. Camelio, C. Williams, **B. Amos**, R. Parker, "Bad Parts: Are Our Manufacturing Systems at Risk of Silent Cyberattacks?" *Security & Privacy, IEEE*, vol. 13, no. 3, pp. 40–47, 2015. [Online]. Available: http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=7118094.

Tech Reports

[T1] Y. Gao, W. Hu, K. Ha, **B. Amos**, P. Pillai, M. Satyanarayanan, "Are cloudlets necessary?" Technical Report CMU-CS-15-139, CMU School of Computer Science, Tech. Rep., 2015. [Online]. Available: http://reports-archive.adm.cs.cmu.edu/anon/anon/2015/CMU-CS-15-139.pdf.

[T2] K. Ha, Y. Abe, Z. Chen, W. Hu, **B. Amos**, P. Pillai, M. Satyanarayanan, "Adaptive vm handoff across cloudlets," Technical Report CMU-CS-15-113, CMU School of Computer Science, Tech. Rep., 2015. [Online]. Available: http://ra.adm.cs.cmu.edu/anon/2015/CMU-CS-15-113.pdf.

[T3] **B. Amos**, D. Easterling, L. Watson, W. Thacker, B. Castle, M. Trosset, "QNSTOP-QuasiNewton Algorithm for Stochastic Optimization," 2014. [Online]. Available: https://vtechworks.lib.vt.edu/bitstream/handle/10919/49672/qnTOMS14.pdf.

Teaching Experience

- Distributed Systems (CMU 15-440/640), Graduate TA — S2016
- Software Design and Data Structures (VT CS 2114), Undergraduate TA — S2013

Industry Experience

- Data Scientist Intern, Adobe Research — May 2014–Aug 2014
- Software Engineer Intern, Snowplow Analytics — Dec 2013–Jan 2014
- Software Engineer Intern, Qualcomm — May 2013–Aug 2013
- Software Engineer Intern, Phoenix Integration — May 2012–Aug 2012
- Network Administrator Intern, Sunapsys — Jan 2011–Aug 2011

Honors & Awards

- NSF Graduate Research Fellowship: $138,000 — 2016–2019
- 1st Place Undergraduate Senior Capstone Award, Virginia Tech Computer Science — 2014
- David Heilman Research Award, Virginia Tech Computer Science — 2014
  - Awarded to the Computer Science student with the most outstanding research experience.
- Senior Scholar Award, Virginia Tech Computer Science — 2014
  - Awarded to the senior in Computer Science with the most outstanding academic record.
- Honorable Mention, CRA Outstanding Undergraduate Researcher Award — 2014
- Awarded eight undergraduate merit scholarships — 2011–2014

Skills

- Languages: Bash, C, C++, Haskell, HTML/CSS/JavaScript, Java, LaTeX, Lua, Make, *Mathematica*, Python, R, Scala
- Frameworks: Akka, Android SDK/NDK, Caffe, Node.js, NumPy, Torch7, Pandas, SciPy, scikit-learn, Spark, Spray
- Systems: Linux, OSX