

Alessandro Checco

Education

- Ph.D. in Computer Science, Hamilton Institute Aug 2014 – Present

Research Experience

- Carnegie Mellon University, Prof. Zico Kolter Apr 2016 – Present
 - Machine learning and optimization
- Carnegie Mellon University, Prof. Mahadev Satyanarayanan Aug 2014 – Apr 2016
 - Applied machine learning and mobile systems
- Virginia Tech, Prof. Jules White May 2012 – May 2014
 - Mobile systems, cyber-physical systems, and security
- Virginia Tech, Prof. Layne Watson Jan 2013 – May 2014
 - Scientific computing, global/stochastic optimization, and bioinformatics
- Virginia Tech, Prof. Binoy Ravindran Nov 2012 – Mar 2014
 - Heterogeneous compilers

Selected Publications

Google Scholar ID: [crhkrNcAAAAJ](#)

- [1] B. Amos, L. Xu, J. Z. Kolter, "Input convex neural networks," *ArXiv preprint arXiv:1609.07152*, 2016. [Online]. Available: <http://arxiv.org/abs/1609.07152>.
- [2] H. Zhao, T. Adel, G. Gordon, B. Amos, "Collapsed Variational Inference for Sum-Product Networks," in *ICML*, 2016. [Online]. Available: <http://www.cs.cmu.edu/~hzhao1/papers/ICML2016/BL-SPN-main.pdf>.
- [3] B. Amos, B. Ludwiczuk, M. Satyanarayanan, "Openface: A general-purpose face recognition library with mobile applications," Technical Report CMU-CS-16-118, CMU School of Computer Science, Tech. Rep., 2016. [Online]. Available: <http://reports-archive.adm.cs.cmu.edu/anon/anon/2016/CMU-CS-16-118.pdf>.
- [4] 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

- Graduate AI (CMU 15-780), TA S2017
- Distributed Systems (CMU 15-440/640), TA S2016
- Software Design and Data Structures (VT CS 2114), TA S2013

Industry Experience

- Data Scientist Intern, Adobe Research May 2014 – Aug 2014
 - I built a web analytics processing engine using **Scala**, **Spark**, **Spray**, **Parquet**, and **HDFS**.
- Software Engineer Intern, Snowplow Analytics Dec 2013 – Jan 2014
 - Open-source **Scala** development with a startup on the Snowplow analytics platform. My commits are online at <https://github.com/snowplow/snowplow/commits?author=bamos>.
 - Developed a new server using **Spray** and **Actors** to store **Thrift** events on **Amazon Kinesis**.
- Software Engineer Intern, Qualcomm May 2013 – Aug 2013
 - I created a specification format language translator for fuzz testing with Python.
- Software Engineer Intern, Phoenix Integration May 2012 – Aug 2012
 - I developed industry software for software integration and design process optimization in **VC++**, **VC#**, and **Java**.
- Network Administrator Intern, Sunapsys Jan 2011 – Aug 2011
 - Internship in high school to replace Windows domain, mail, DHCP, and DNS servers with virtual **Linux** servers using **KVM** and **virsh**.

Skills

Languages	Bash, C, C++, CSS, Matlab, JavaScript, Fortran, HTML, \LaTeX , <i>Mathematica</i> , Python, R
Frameworks	Spark, Cloudera, Pandas, NumPy, SciPy, SimPy, scikit-learn
Algorithm design	Design, convergence rate and complexity analysis of decentralised algorithms on graphs.
Convex optimisation	Convex optimisation, with application to discrete problems. Numerical methods for approximate solution of optimisation problems.
Data Mining	Monte Carlo Markov chains techniques for data mining and feature selection, applied to medical diagnostic and artificial olfaction.
Privacy in recommender systems	Probabilistic matrix factorisation applied to recommender systems, with focus on privacy issues.
Simulators	Event-based simulators design for wireless network analysis.
Statistical inference	Bayesian modelling and exploratory data analysis, with focus on big data.

CMU Graduate Coursework

- Statistical Machine Learning (10-702, Au), L. Wasserman S2017
- Deep Reinforcement Learning (10-703), R. Salakhutdinov and A. Fragkiadaki S2017
- Intermediate Statistics (10-705, Au), L. Wasserman F2016
- Topics in Deep Learning (10-807), R. Salakhutdinov F2016
- Convex Optimization (10-725), R. J. Tibshirani F2015
- Algorithms in the Real World (15-853), G. Blelloch and A. Gupta F2015
- Semantics of Programming Languages (15-812), A. Platzner S2015
- Optimizing Compilers for Modern Architecture (15-745), T. Mowry S2015
- Advanced Operating and Distributed Systems (15-712), D. Andersen F2014
- Mobile and Pervasive Computing (15-812), M. Satyanarayanan and D. Siewiorek F2014

Honors & Awards

- NSF Graduate Research Fellowship 2016 – 2019
- 1st Place Undergraduate Senior Capstone Award, Virginia Tech Computer Science 2014
- David Heilman Research Award, Virginia Tech Computer Science 2014
- Senior Scholar Award, Virginia Tech Computer Science 2014
- Honorable Mention, CRA Outstanding Undergraduate Researcher Award 2014
- Awarded eight undergraduate merit scholarships 2011 – 2014

Conference Proceedings

- [C1] H. Zhao, T. Adel, G. Gordon, B. Amos, "Collapsed Variational Inference for Sum-Product Networks," in *ICML*, 2016. [Online]. Available: <http://www.cs.cmu.edu/~hzhao1/papers/ICML2016/BL-SPN-main.pdf>.
- [C2] 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] B. Amos, B. Ludwiczuk, M. Satyanarayanan, "Openface: A general-purpose face recognition library with mobile applications," Technical Report CMU-CS-16-118, CMU School of Computer Science, Tech. Rep., 2016. [Online]. Available: <http://reports-archive.adm.cs.cmu.edu/anon/anon/2016/CMU-CS-16-118.pdf>.
- [T2] 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>.
- [T3] 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>.

- [T4] 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>.

Posters

- [P1] B. Amos and J. Z. Kolter, "Input-convex deep networks," in *ICLR Workshop*, 2016. [Online]. Available: <http://bamos.github.io/data/posters/2016-iclr-icnn.pdf>.
- [P2] B. Amos and M. Satyanarayanan, "Face Recognition for Context Sensitive IoT Systems," in *HotMobile*, 2016. [Online]. Available: <http://bamos.github.io/data/posters/2016-hotmobile-facerec.pdf>.