# Brandon Amos

☎ (540) 947 1238    •    ✉ bamos@cs.cmu.edu    •    🕮 bamos.github.io

in bdamos    •    🐦 brandondamos    •    ⓖ bamos

Generated on May 27, 2018

## Education

| | |
|---|---|
| ○ Ph.D. in Computer Science, Carnegie Mellon University | Aug 2014 – Present |
| ○ M.S. in Computer Science, Carnegie Mellon University | Aug 2014 – May 2016 |
| ○ B.S. in Computer Science, Virginia Tech (3.99/4.00) | Aug 2011 – May 2014 |
| ○ Northside High School (Roanoke, Virginia) | May 2011 |

## Research Experience

| | |
|---|---|
| ○ Carnegie Mellon University, Zico Kolter | Apr 2016 – Present |
| ○ Machine learning and optimization | |
| ○ Intel Labs, Vladlen Koltun | June 2018 - Sept 2018 |
| ○ Machine learning | |
| ○ Google DeepMind, Nando de Freitas | May 2017 – Oct 2017 |
| ○ Machine and reinforcement learning | |
| ○ Carnegie Mellon University, Mahadev Satyanarayanan | Aug 2014 – Apr 2016 |
| ○ Applied machine learning and mobile systems | |
| ○ Virginia Tech, Jules White | May 2012 – May 2014 |
| ○ Mobile systems, cyber-physical systems, and security | |
| ○ Virginia Tech, Layne Watson | Jan 2013 – May 2014 |
| ○ Scientific computing, global/stochastic optimization, and bioinformatics | |
| ○ Virginia Tech, Binoy Ravindran | Nov 2012 – Mar 2014 |
| ○ Heterogeneous compilers | |

## Selected Publications                    Google Scholar ID: d8gdZR4AAAAJ

[1]  N. Brown,  T. Sandholm,  **B. Amos**, "Depth-limited solving for imperfect-information games," *ArXiv preprint arXiv:1805.08195*, 2018. [Online]. Available: http://arxiv.org/abs/1805.08195.

[2]  **B. Amos**,  L. Dinh,  S. Cabi,  T. Rothörl,  S. G. Colmenarejo,  A. Muldal,  T. Erez,  Y. Tassa, N. Freitas,  M. Denil, "Learning Awareness Models," in *International Conference on Learning Representations*, 2018. [Online]. Available: https://openreview.net/forum?id=r1HhRfWRZ.

[3]  P. L. Donti,  **B. Amos**,  J. Z. Kolter, "Task-based End-to-end Model Learning," in *NIPS*, 2017. [Online]. Available: http://arxiv.org/abs/1703.04529.

[4]  **B. Amos** and  J. Z. Kolter, "OptNet: Differentiable Optimization as a Layer in Neural Networks," in *ICML*, 2017. [Online]. Available: http://arxiv.org/abs/1703.00443.

[5]  **B. Amos**,  L. Xu,  J. Z. Kolter, "Input Convex Neural Networks," in *ICML*, 2017. [Online]. Available: http://arxiv.org/abs/1609.07152.

[6]  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.

[7]  **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.

[8] **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
- 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

## CMU Graduate Coursework

- Statistical Machine Learning (10-702, Au), L. Wasserman                       S2017
- Deep Reinforcement Learning (10-703, Au), 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. Platzer                       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

## Skills

| | |
|---|---|
| Languages | C, C++, Fortran, Haskell, Java, Lua, Make, *Mathematica*, Python, R, Scala |
| Frameworks | Akka, NumPy, Pandas, PyTorch, SciPy, TensorFlow, Torch7 |
| Systems | Linux, OSX |

## All Publications

### Preprints and Tech Reports

[P1] N. Brown, T. Sandholm, **B. Amos**, "Depth-limited solving for imperfect-information games," *ArXiv preprint arXiv:1805.08195*, 2018. [Online]. Available: http://arxiv.org/abs/1805.08195.

[P2] **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.

[P3] 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.

[P4] 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.

[P5] **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.

### Conference Proceedings

[C1] **B. Amos**, L. Dinh, S. Cabi, T. Rothörl, S. G. Colmenarejo, A. Muldal, T. Erez, Y. Tassa, N. Freitas, M. Denil, "Learning awareness models," in *International Conference on Learning Representations*, 2018. [Online]. Available: https://openreview.net/forum?id=r1HhRfWRZ.

[C2] J. Wang, **B. Amos**, A. Das, P. Pillai, N. Sadeh, M. Satyanarayanan, "A scalable and privacy-aware iot service for live video analytics," in *Proceedings of the 8th ACM on Multimedia Systems Conference*, ACM, 2017, pp. 38–49.

[C3] P. L. Donti, **B. Amos**, J. Z. Kolter, "Task-based end-to-end model learning," in *NIPS*, 2017. [Online]. Available: http://arxiv.org/abs/1703.04529.

[C4] **B. Amos** and J. Z. Kolter, "Optnet: differentiable optimization as a layer in neural networks," in *ICML*, 2017. [Online]. Available: http://arxiv.org/abs/1703.00443.

[C5] **B. Amos**, L. Xu, J. Z. Kolter, "Input convex neural networks," in *ICML*, 2017. [Online]. Available: http://arxiv.org/abs/1609.07152.

[C6] 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.

[C7] **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.

### Journal Articles

[J1] M. Chen, **B. Amos**, L. T. Watson, J. Tyson, Y. Cao, C. Shaffer, M. Trosset, C. Oguz, G. Kakoti, "Quasi-newton stochastic optimization algorithm for parameter estimation of a stochastic model of the budding yeast cell cycle," *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 2017.

### Workshop, Symposium, and Short Papers

[W1] K. Ha, Y. Abe, T. Eiszler, Z. Chen, W. Hu, **B. Amos**, R. Upadhyaya, P. Pillai, M. Satyanarayanan, "You can teach elephants to dance: Agile vm handoff for edge computing," in *Proceedings of the Second ACM/IEEE Symposium on Edge Computing*, ACM, 2017, p. 12.

[W2] Z. Chen, W. Hu, J. Wang, S. Zhao, **B. Amos**, G. Wu, K. Ha, K. Elgazzar, P. Pillai, R. Klatzky, D. Siewiorek, M. Satyanarayanan, "An empirical study of latency in an emerging class of edge computing applications for wearable cognitive assistance," in *Proceedings of the Second ACM/IEEE Symposium on Edge Computing*, ACM, 2017, p. 12.

[W3]  W. Hu, Y. Gao, K. Ha, J. Wang, **B. Amos**, Z. Chen, P. Pillai, M. Satyanarayanan, "Quantifying the impact of edge computing on mobile applications," in *Proceedings of the 7th ACM SIGOPS Asia-Pacific Workshop on Systems*, ACM, 2016, p. 5.

[W4]  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.

[W5]  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.

[W6]  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.

[W7]  **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.

[W8]  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.

[W9]  **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.

## Posters

[S1]  **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.

[S2]  **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.