Brandon Amos

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bamos • Last updated on March 7, 2021

Current Position

Research Scientist | Facebook AI | NYC 2019 – Present

Education

Ph.D. in Computer Science (0.00/0.00) 2019
Carnegie Mellon University | Pittsburgh, PA
Differentiable Optimization-Based Modeling for Machine Learning
Advisors: J. Zico Kolter (2016 – 2019), Mahadev Satyanarayanan (2014 – 2016)

B.S. in Computer Science (3.99/4.00) 2014
Virginia Tech | Blacksburg, VA
Advisors: Layne Watson, Jules White, Binoy Ravindran

Northside High School | Roanoke, VA 2011

Research Internships

Intel Labs | Santa Clara, CA | Host: Vladlen Koltun 2018
Google DeepMind | London, UK | Hosts: Misha Denil and Nando de Freitas 2017
Adobe Research | San Jose, CA | Host: David Tompkins 2014

Honors & Awards

NSF Graduate Research Fellowship 2016 – 2019
Nine undergraduate scholarships 2011 – 2014
Roanoke County Public Schools Engineering, Salem–Roanoke County Chamber of Commerce, Papa John's, Scottish Rite of Freemasonry, VT Intelligence Community Conter for Academic Excellence, VT Pamplin Leader, VT Benjamin F. Bock, VT Gay B. Shober, VT I. Luck Gravett

Publications

Google Scholar ID: d8gdZR4AAAAJ

2021

1. *Aligning Time Series on Incomparable Spaces* [code]
   S. Cohen, G. Luise, A. Terenin, **B. Amos**, and M. Deisenroth
   AISTATS 2021

2. *Learning Neural Event Functions for Ordinary Differential Equations*
   R. Chen, **B. Amos**, and M. Nickel
   ICLR 2021

3. *Neural Spatio-Temporal Point Processes*
   R. Chen, **B. Amos**, and M. Nickel
   ICLR 2021

4. *Improving Sample Efficiency in Model-Free Reinforcement Learning from Images*
   D. Yarats, A. Zhang, I. Kostrikov, **B. Amos**, J. Pineau, and R. Fergus
   AAAI 2021

2020

5. *On the model-based stochastic value gradient for continuous reinforcement learning*
   B. Amos, S. Stanton, D. Yarats, and A. Wilson
   arXiv 2020

6. *Objective Mismatch in Model-based Reinforcement Learning*
   N. Lambert, **B. Amos**, O. Yadan, and R. Calandra
   L4DC 2020

7. *QNSTOP: Quasi-Newton Algorithm for Stochastic Optimization* [code]
   B. Amos, D. Easterling, L. Watson, W. Thacker, B. Castle, and M. Trosset
   ACM TOMS 2020

8. *The Differentiable Cross-Entropy Method* [code]
   B. Amos and D. Yarats
   ICML 2020

2019

9. *Differentiable Convex Optimization Layers* [code]
   A. Agrawal*, **B. Amos***, S. Barratt*, S. Boyd*, S. Diamond*, and J. Z. Kolter*
   NeurIPS 2019

10. *Generalized Inner Loop Meta-Learning* [code]
    E. Grefenstette, **B. Amos**, D. Yarats, P. Htut, A. Molchanov, F. Meier, D. Kiela, K. Cho, and S. Chintala
    arXiv 2019

11. *The Limited Multi-Label Projection Layer* [code]
    B. Amos, V. Koltun, and J. Z. Kolter
    arXiv 2019

12. *Differentiable Optimization-Based Modeling for Machine Learning* [code]
    B. Amos
    Ph.D. Thesis 2019

2018

13. *Differentiable MPC for End-to-end Planning and Control* [code]
    B. Amos, I. Rodriguez, J. Sacks, B. Boots, and J. Z. Kolter
    NeurIPS 2018

14. *Depth-Limited Solving for Imperfect-Information Games*
    N. Brown, T. Sandholm, and **B. Amos**
    NeurIPS 2018

15. *Learning Awareness Models*
    B. Amos, L. Dinh, S. Cabi, T. Rothörl, S. Colmenarejo, A. Muldal, T. Erez, Y. Tassa, N. de Freitas, and M. Denil
    ICLR 2018

16. *Enabling Live Video Analytics with a Scalable and Privacy-Aware Framework*
    J. Wang, **B. Amos**, A. Das, P. Pillai, N. Sadeh, and M. Satyanarayanan
    ACM TOMM 2018

2017

17. *A Scalable and Privacy-Aware IoT Service for Live Video Analytics* [code]
    J. Wang, **B. Amos**, A. Das, P. Pillai, N. Sadeh, and M. Satyanarayanan
    ACM MMSys 2017
    Best Paper Award

18. *Task-based End-to-end Model Learning* [code]
P. Donti, **B. Amos**, and J. Z. Kolter
NeurIPS 2017

19. *OptNet: Differentiable Optimization as a Layer in Neural Networks* [code]
B. Amos and J. Z. Kolter
ICML 2017

20. *Input Convex Neural Networks* [code]
B. Amos, L. Xu, and J. Z. Kolter
ICML 2017

21. *Quasi-Newton Stochastic Optimization Algorithm for Parameter Estimation of a Stochastic Model of the Budding Yeast Cell Cycle*
M. Chen, **B. Amos**, L. Watson, J. Tyson, Y. Cao, C. Shaffer, M. Trosset, C. Oguz, and G. Kakoti
IEEE/ACM TCBB 2017

22. *You can teach elephants to dance: agile VM handoff for edge computing*
K. Ha, Y. Abe, T. Eiszler, Z. Chen, W. Hu, **B. Amos**, R. Upadhyaya, P. Pillai, and M. Satyanarayanan
SEC 2017

23. *An Empirical Study of Latency in an Emerging Class of Edge Computing Applications for Wearable Cognitive Assistance*
Z. Chen, W. Hu, J. Wang, S. Zhao, **B. Amos**, G. Wu, K. Ha, K. Elgazzar, P. Pillai, R. Klatzky, D. Siewiorek, and M. Satyanarayanan
SEC 2017

2016

24. *Collapsed Variational Inference for Sum-Product Networks*
H. Zhao, T. Adel, G. Gordon, and **B. Amos**
ICML 2016

25. *Quantifying the impact of edge computing on mobile applications*
W. Hu, Y. Gao, K. Ha, J. Wang, **B. Amos**, Z. Chen, P. Pillai, and M. Satyanarayanan
ACM SIGOPS 2016

26. *Privacy mediators: helping IoT cross the chasm*
N. Davies, N. Taft, M. Satyanarayanan, S. Clinch, and **B. Amos**
HotMobile 2016

27. *OpenFace: A general-purpose face recognition library with mobile applications* [code]
B. Amos, B. Ludwiczuk, and M. Satyanarayanan
CMU 2016

2015

28. *Edge Analytics in the Internet of Things*
M. Satyanarayanan, P. Simoens, Y. Xiao, P. Pillai, Z. Chen, K. Ha, W. Hu, and **B. Amos**
IEEE Pervasive Computing 2015

29. *Bad Parts: Are Our Manufacturing Systems at Risk of Silent Cyberattacks?*
H. Turner, J. White, J. Camelio, C. Williams, **B. Amos**, and R. Parker
IEEE Security & Privacy 2015

30. *Early Implementation Experience with Wearable Cognitive Assistance Applications*
Z. Chen, L. Jiang, W. Hu, K. Ha, **B. Amos**, P. Pillai, A. Hauptmann, and M. Satyanarayanan
WearSys 2015

31. *The Case for Offload Shaping*
W. Hu, **B. Amos**, Z. Chen, K. Ha, W. Richter, P. Pillai, B. Gilbert, J. Harkes, and M. Satyanarayanan
HotMobile 2015

32. *Are Cloudlets Necessary?*
Y. Gao, W. Hu, K. Ha, **B. Amos**, P. Pillai, and M. Satyanarayanan
CMU 2015

33. *Adaptive VM handoff across cloudlets*
K. Ha, Y. Abe, Z. Chen, W. Hu, **B. Amos**, P. Pillai, and M. Satyanarayanan
CMU 2015

2014

34. *Global Parameter Estimation for a Eukaryotic Cell Cycle Model in Systems Biology*
T. Andrew, **B. Amos**, D. Easterling, C. Oguz, W. Baumann, J. Tyson, and L. Watson
SummerSim 2014

2013

35. *Applying machine learning classifiers to dynamic Android malware detection at scale* [code]
B. Amos, H. Turner, and J. White
IWCMC 2013

Repositories

facebookresearch/dcem	★77	*Differentiable Cross-Entropy Method Experiments*	2020
facebookresearch/higher	★1.1k	*PyTorch higher-order gradient and optimization library*	2019
bamos/thesis	★238	*Ph.D. Thesis LaTeX source code*	2019
cvxgrp/cvxpylayers	★862	*Differentiable convex optimization layers*	2019
locuslab/mpc.pytorch	★436	*Differentiable model-predictive control*	2018
locuslab/icnn	★212	*Input Convex Neural Network Experiments*	2017
locuslab/optnet	★360	*OptNet Experiments*	2017
locuslab/qpth	★461	*Differentiable PyTorch QP solver*	2017
bamos/densenet.pytorch	★681	*PyTorch DenseNet implementation*	2017
bamos/block	★253	*Intelligent block matrix constructions*	2017
bamos/setGPU	★92	*Automatically use the least-loaded GPU*	2017
bamos/dcgan-completion.tensorflow	★1.3k	*Image completion with GANs*	2016
cmusatyalab/openface	★13.9k	*Face recognition with deep neural networks*	2015
bamos/zsh-history-analysis	★160	*Analyze and plot your zsh history*	2014
bamos/cv	★307	*My YAML/LaTeX/Markdown cv*	2013
bamos/dotfiles	★222	*Linux, mutt, xmonad, i3, vim, emacs, zsh*	2012

Invited Talks

Max Planck Institute for Intelligent Systems (Tübingen) Seminar	2020
Montreal Institute for Learning Algorithms Seminar	2020
ECCV Deep Declarative Networks Tutorial	2020
CVPR Deep Declarative Networks Workshop	2020
Caltech CS 159, Guest Lecture	2020
SIAM MDS Minisymposium on Learning Parameterized Energy Minimization Models	2020
New York University CILVR Seminar	2019
INFORMS Session on Prediction and Optimization	2019
Facebook AI Research	2019
ISMP Session on Machine Learning and Optimization	2018
Google Brain	2018

Bosch Center for AI	2018
Waymo Research	2018
Tesla AI	2018
NVIDIA Robotics	2018
Salesforce Research	2018
OpenAI	2018
NNAISENSE	2018

Students & Advising

Aaron Lou (Cornell), FAIR Intern (with Max Nickel)	2020
Ricky Chen (Toronto), FAIR Intern (with Max Nickel)	2020
Paul Liang (CMU), FAIR Intern (with Ed Grefenstette and Tim Rocktäschel)	2020
Phillip Wang (CMU), Undergraduate Researcher	2018
Lei Xu (Tsinghua), CMU Intern (with J. Zico Kolter)	2016

Professional Activities

Reviewing: AAAI, ICML, NeurIPS, ICLR*, ICCV, CVPR, ICRA *Outstanding reviewer

NeurIPS Learning Meets Combinatorial Optimization Workshop Organizer	2020
CVPR Deep Declarative Workshop Organizer	2020
ECCV Deep Declarative Tutorial Organizer	2020
CMU CSD MS Admissions	2014 – 2015

Teaching

Graduate AI (CMU 15-780), TA	S2017
Distributed Systems (CMU 15-440/640), TA	S2016
Software Design and Data Structures (VT CS2114), TA	S2013

Skills

Languages	C, C++, Fortran, Haskell, Java, Lua, Make, Mathematica, Python, R, Scala
Frameworks	JAX, NumPy, Pandas, PyTorch, SciPy, TensorFlow, Torch7
Tools	Linux, emacs, vim, evil, org, mu4e, xmonad, i3, git, tmux, zsh