Brandon Amos

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bamos • Last updated on August 7, 2021

Current Position

Research Scientist | Facebook AI | New York, NY 2019 – Present

Education

Ph.D. in Computer Science (0.00/0.00) 2014 – 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) 2011 – 2014
Virginia Tech | Blacksburg, VA
Advisors: Layne Watson, Jules White, Binoy Ravindran

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. *On the model-based stochastic value gradient for continuous reinforcement learning* [code] [slides] [talk]
   B. Amos, S. Stanton, D. Yarats, and A. Wilson
   L4DC 2021 (Oral)

2. *Riemannian Convex Potential Maps* [code] [slides]
   S. Cohen*, **B. Amos***, and Y. Lipman
   ICML 2021

3. *CombOptNet: Fit the Right NP-Hard Problem by Learning Integer Programming Constraints* [code]
   A. Paulus, M. Rolínek, V. Musil, **B. Amos**, and G. Martius
   ICML 2021

4. *Neural Fixed-Point Acceleration for Convex Optimization* [code]
   S. Venkataraman* and **B. Amos***
   ICML AutoML 2021

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

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

7. *Neural Spatio-Temporal Point Processes* [code]
   R. Chen, **B. Amos**, and M. Nickel
   ICLR 2021

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

9. *MBRL-Lib: A Modular Library for Model-based Reinforcement Learning* [code]
   L. Pineda, **B. Amos**, A. Zhang, N. Lambert, and R. Calandra
   arXiv 2021

2020

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

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

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

13. *Neural Potts Model*
    T. Sercu, R. Verkuil, J. Meier, **B. Amos**, Z. Lin, C. Chen, J. Liu, Y. LeCun, and A. Rives
    MLCB 2020

14. *Deep Riemannian Manifold Learning*
    A. Lou, M. Nickel, and **B. Amos**
    NeurIPS Geo4dl 2020

2019

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

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

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

18. *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

2018

19. *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

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

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

22. *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

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

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

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

26. *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

27. *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

28. *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

29. *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)

2016

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

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

32. *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

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

2015

34. *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

35. *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

36. *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

37. *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

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

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

2014

40. *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

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

Repositories

facebookresearch/mbrl-lib	★444	*Model-based reinforcement learning library*	2021
facebookresearch/dcem	★91	*The Differentiable Cross-Entropy Method*	2020
facebookresearch/higher	★1.2k	*PyTorch higher-order gradient and optimization library*	2019
bamos/thesis	★256	*Ph.D. Thesis LaTeX source code*	2019
cvxgrp/cvxpylayers	★1k	*Differentiable Convex Optimization Layers*	2019
locuslab/mpc.pytorch	★470	*Differentiable Model-Predictive Control*	2018
locuslab/icnn	★226	*Input Convex Neural Networks*	2017

locuslab/optnet | ★369 | *OptNet experiments* 2017
locuslab/qpth | ★488 | *Differentiable PyTorch QP solver* 2017
bamos/densenet.pytorch | ★703 | *PyTorch DenseNet implementation* 2017
bamos/block | ★256 | *Intelligent block matrix constructions* 2017
bamos/setGPU | ★97 | *Automatically use the least-loaded GPU* 2017
bamos/dcgan-completion.tensorflow | ★1.3k | *Image completion with GANs* 2016
cmusatyalab/openface | ★14.1k | *Face recognition with deep neural networks* 2015
bamos/zsh-history-analysis | ★161 | *Analyze and plot your zsh history* 2014
bamos/cv | ★320 | *My YAML/LaTeX/Markdown cv* 2013
bamos/dotfiles | ★229 | *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

Interns and Students

Samuel Cohen (visiting FAIR from UCL) 2021
Eugene Vinitsky (visiting FAIR from Berkeley) 2021
Arnaud Fickinger (visiting FAIR from Berkeley) 2021
Aaron Lou (visiting FAIR from Cornell) 2020
Ricky Chen (visiting FAIR from Toronto) 2020
Paul Liang (visiting FAIR from CMU) 2020
Phillip Wang (at CMU, now: CEO at Gather) 2018
Lei Xu (visiting CMU from Tsinghua, now: Ph.D. student at MIT) 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