Brandon Amos

bda@fb.com • bamos.github.io • bdamos • brandondamos
bamos • Last updated on January 15, 2022

Current Position

Research Scientist, Facebook AI, New York City 2019 – Present

Education

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

B.S. in Computer Science, Virginia Tech (3.99/4.00) 2011 – 2014

Research Internships

Intel Labs, Santa Clara (Host: Vladlen Koltun) 2018
Google DeepMind, London (Hosts: Misha Denil and Nando de Freitas) 2017
Adobe Research, San Jose (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]

Representative publications that I am a primary author on are highlighted.

2021

1. *On the model-based stochastic value gradient for continuous reinforcement learning* [code] [slides]
   Brandon Amos, Samuel Stanton, Denis Yarats, and Andrew Gordon Wilson
   L4DC 2021 (Oral)

2. *Riemannian Convex Potential Maps* [code] [slides]
   Samuel Cohen*, **Brandon Amos***, and Yaron Lipman
   ICML 2021

3. *CombOptNet: Fit the Right NP-Hard Problem by Learning Integer Programming Constraints* [code]
   Anselm Paulus, Michal Rolínek, Vít Musil, **Brandon Amos**, and Georg Martius
   ICML 2021

4. *Scalable Online Planning via Reinforcement Learning Fine-Tuning*
   Arnaud Fickinger, Hengyuan Hu, **Brandon Amos**, Stuart Russell, and Noam Brown
   NeurIPS 2021

5. *Aligning Time Series on Incomparable Spaces* [code] [slides]
   Samuel Cohen, Giulia Luise, Alexander Terenin, **Brandon Amos**, and Marc Peter Deisenroth
   AISTATS 2021

6. *Learning Neural Event Functions for Ordinary Differential Equations* [code]
   Ricky T. Q. Chen, **Brandon Amos**, and Maximilian Nickel
   ICLR 2021

7. *Neural Spatio-Temporal Point Processes* [code]
   Ricky T. Q. Chen, **Brandon Amos**, and Maximilian Nickel
   ICLR 2021

8. *Improving Sample Efficiency in Model-Free Reinforcement Learning from Images* [code]
   Denis Yarats, Amy Zhang, Ilya Kostrikov, **Brandon Amos**, Joelle Pineau, and Rob Fergus
   AAAI 2021

9. *Neural Fixed-Point Acceleration for Convex Optimization* [code]
   Shobha Venkataraman* and **Brandon Amos***
   ICML AutoML 2021

10. *Sliced Multi-Marginal Optimal Transport*
    Samuel Cohen, Alexander Terenin, Yannik Pitcan, **Brandon Amos**, Marc Peter Deisenroth, and K S Sesh Kumar
    NeurIPS OTML 2021

11. *Input Convex Gradient Networks*
    Jack Richter-Powell, Jonathan Lorraine, and **Brandon Amos**
    NeurIPS OTML 2021

12. *Cross-Domain Imitation Learning via Optimal Transport*
    Arnaud Fickinger, Samuel Cohen, Stuart Russell, and **Brandon Amos**
    NeurIPS DeepRL 2021

13. *Imitation Learning from Pixel Observations for Continuous Control*
    Samuel Cohen, **Brandon Amos**, Marc Peter Deisenroth, Mikael Henaff, Eugene Vinitsky, and Denis Yarats
    NeurIPS DeepRL 2021

14. *MBRL-Lib: A Modular Library for Model-based Reinforcement Learning* [code]
    Luis Pineda, **Brandon Amos**, Amy Zhang, Nathan Lambert, and Roberto Calandra
    arXiv 2021

2020

15. *The Differentiable Cross-Entropy Method* [code] [slides]
    Brandon Amos and Denis Yarats
    ICML 2020

16. *Objective Mismatch in Model-based Reinforcement Learning*
    Nathan Lambert, **Brandon Amos**, Omry Yadan, and Roberto Calandra
    L4DC 2020

17. *QNSTOP: Quasi-Newton Algorithm for Stochastic Optimization* [code]
    Brandon Amos, David Easterling, Layne T. Watson, William Thacker, Brent Castle, and Michael Trosset
    ACM TOMS 2020

18. *Neural Potts Model*
    Tom Sercu, Robert Verkuil, Joshua Meier, **Brandon Amos**, Zeming Lin, Caroline Chen, Jason Liu, Yann LeCun, and Alexander Rives
    MLCB 2020

19. *Deep Riemannian Manifold Learning*
    Aaron Lou, Maximilian Nickel, and **Brandon Amos**
    NeurIPS Geo4dl 2020

2019

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

21. *Differentiable Convex Optimization Layers* [code]
Akshay Agrawal*, **Brandon Amos***, Shane Barratt*, Stephen Boyd*, Steven Diamond*, and J. Zico Kolter*
NeurIPS 2019

22. *The Limited Multi-Label Projection Layer* [code]
Brandon Amos, Vladlen Koltun, and J. Zico Kolter
arXiv 2019

23. *Generalized Inner Loop Meta-Learning* [code]
Edward Grefenstette, **Brandon Amos**, Denis Yarats, Phu Mon Htut, Artem Molchanov, Franziska Meier, Douwe Kiela, Kyunghyun Cho, and Soumith Chintala
arXiv 2019

2018

24. *Learning Awareness Models*
Brandon Amos, Laurent Dinh, Serkan Cabi, Thomas Rothörl, Sergio Gómez Colmenarejo, Alistair Muldal, Tom Erez, Yuval Tassa, Nando de Freitas, and Misha Denil
ICLR 2018

25. *Differentiable MPC for End-to-end Planning and Control* [code]
Brandon Amos, Ivan Dario Jimenez Rodriguez, Jacob Sacks, Byron Boots, and J. Zico Kolter
NeurIPS 2018

26. *Depth-Limited Solving for Imperfect-Information Games*
Noam Brown, Tuomas Sandholm, and **Brandon Amos**
NeurIPS 2018

27. *Enabling Live Video Analytics with a Scalable and Privacy-Aware Framework*
Junjue Wang, **Brandon Amos**, Anupam Das, Padmanabhan Pillai, Norman Sadeh, and Mahadev Satyanarayanan
ACM TOMM 2018

2017

28. *OptNet: Differentiable Optimization as a Layer in Neural Networks* [code] [slides]
Brandon Amos and J. Zico Kolter
ICML 2017

29. *Input Convex Neural Networks* [code] [slides]
Brandon Amos, Lei Xu, and J. Zico Kolter
ICML 2017

30. *Task-based End-to-end Model Learning* [code]
Priya L. Donti, **Brandon Amos**, and J. Zico Kolter
NeurIPS 2017

31. *Quasi-Newton Stochastic Optimization Algorithm for Parameter Estimation of a Stochastic Model of the Budding Yeast Cell Cycle*
Minghan Chen, **Brandon Amos**, Layne T. Watson, John Tyson, Yang Cao, Cliff Shaffer, Michael Trosset, Cihan Oguz, and Gisella Kakoti
IEEE/ACM TCBB 2017

32. *You can teach elephants to dance: agile VM handoff for edge computing*
Kiryong Ha, Yoshihisa Abe, Thomas Eiszler, Zhuo Chen, Wenlu Hu, **Brandon Amos**, Rohit Upadhyaya, Padmanabhan Pillai, and Mahadev Satyanarayanan
SEC 2017

33. *An Empirical Study of Latency in an Emerging Class of Edge Computing Applications for Wearable Cognitive Assistance*
Zhuo Chen, Wenlu Hu, Junjue Wang, Siyan Zhao, **Brandon Amos**, Guanhang Wu, Kiryong Ha, Khalid Elgazzar, Padmanabhan Pillai, Roberta Klatzky, Daniel Siewiorek, and Mahadev Satyanarayanan
SEC 2017

34. *A Scalable and Privacy-Aware IoT Service for Live Video Analytics* [code]
Junjue Wang, **Brandon Amos**, Anupam Das, Padmanabhan Pillai, Norman Sadeh, and Mahadev Satyanarayanan
ACM MMSys 2017 (Best Paper)

2016

35. *OpenFace: A general-purpose face recognition library with mobile applications* [code]
Brandon Amos, Bartosz Ludwiczuk, and Mahadev Satyanarayanan
CMU 2016

36. *Collapsed Variational Inference for Sum-Product Networks*
Han Zhao, Tameem Adel, Geoff Gordon, and **Brandon Amos**
ICML 2016

37. *Quantifying the impact of edge computing on mobile applications*
Wenlu Hu, Ying Gao, Kiryong Ha, Junjue Wang, **Brandon Amos**, Zhuo Chen, Padmanabhan Pillai, and Mahadev Satyanarayanan
ACM SIGOPS 2016

38. *Privacy mediators: helping IoT cross the chasm*
Nigel Davies, Nina Taft, Mahadev Satyanarayanan, Sarah Clinch, and **Brandon Amos**
HotMobile 2016

2015 and earlier

39. *Edge Analytics in the Internet of Things*
Mahadev Satyanarayanan, Pieter Simoens, Yu Xiao, Padmanabhan Pillai, Zhuo Chen, Kiryong Ha, Wenlu Hu, and **Brandon Amos**
IEEE Pervasive Computing 2015

40. *Bad Parts: Are Our Manufacturing Systems at Risk of Silent Cyberattacks?*
Hamilton Turner, Jules White, Jaime A. Camelio, Christopher Williams, **Brandon Amos**, and Robert Parker
IEEE Security & Privacy 2015

41. *Early Implementation Experience with Wearable Cognitive Assistance Applications*
Zhuo Chen, Lu Jiang, Wenlu Hu, Kiryong Ha, **Brandon Amos**, Padmanabhan Pillai, Alex Hauptmann, and Mahadev Satyanarayanan
WearSys 2015

42. *The Case for Offload Shaping*
Wenlu Hu, **Brandon Amos**, Zhuo Chen, Kiryong Ha, Wolfgang Richter, Padmanabhan Pillai, Benjamin Gilbert, Jan Harkes, and Mahadev Satyanarayanan
HotMobile 2015

43. *Are Cloudlets Necessary?*
Ying Gao, Wenlu Hu, Kiryong Ha, **Brandon Amos**, Padmanabhan Pillai, and Mahadev Satyanarayanan
CMU 2015

44. *Adaptive VM handoff across cloudlets*
Kiryong Ha, Yoshihisa Abe, Zhuo Chen, Wenlu Hu, **Brandon Amos**, Padmanabhan Pillai, and Mahadev Satyanarayanan
CMU 2015

45. *Global Parameter Estimation for a Eukaryotic Cell Cycle Model in Systems Biology*
Tricity Andrew, **Brandon Amos**, David Easterling, Cihan Oguz, William Baumann, John Tyson, and Layne T. Watson
SummerSim 2014

46. *Applying machine learning classifiers to dynamic Android malware detection at scale* [code]
Brandon Amos, Hamilton Turner, and Jules White
IWCMC 2013

Repositories

facebookresearch/theseus	★203	*Differentiable non-linear optimization library*	2021
facebookresearch/mbrl-lib	★547	*Model-based reinforcement learning library*	2021
facebookresearch/dcem	★96	*The Differentiable Cross-Entropy Method*	2020
facebookresearch/higher	★1.3k	*PyTorch higher-order gradient and optimization library*	2019
bamos/thesis	★259	*Ph.D. Thesis LaTeX source code*	2019
cvxgrp/cvxpylayers	★1.2k	*Differentiable Convex Optimization Layers*	2019
locuslab/mpc.pytorch	★512	*Differentiable Model-Predictive Control*	2018
locuslab/icnn	★233	*Input Convex Neural Networks*	2017
locuslab/optnet	★377	*OptNet experiments*	2017
locuslab/qpth	★513	*Differentiable PyTorch QP solver*	2017
bamos/densenet.pytorch	★735	*PyTorch DenseNet implementation*	2017
bamos/block	★259	*Intelligent block matrix constructions*	2017
bamos/setGPU	★98	*Automatically use the least-loaded GPU*	2017
bamos/dcgan-completion.tensorflow	★1.3k	*Image completion with GANs*	2016
cmusatyalab/openface	★14.3k	*Face recognition with deep neural networks*	2015
bamos/zsh-history-analysis	★169	*Analyze and plot your zsh history*	2014
bamos/cv	★339	*Source for this CV: Creates LaTeX/Markdown from YAML/BibTeX*	2013
bamos/dotfiles	★233	*Linux, mutt, xmonad, vim, emacs, zsh*	2012

Invited Talks

Columbia University	2021
IBM Research	2021
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
UC Berkeley	2018

Interns and Students

Eugene Vinitsky (visiting FAIR from Berkeley)	2021 – 2022
Arnaud Fickinger (visiting FAIR from Berkeley)	2021 – 2022
Samuel Cohen (visiting FAIR from UCL)	2021 – 2022
Aaron Lou (visiting FAIR from Cornell and Stanford)	2020 – 2022
Ricky Chen (visiting FAIR from Toronto, now: scientist at FAIR)	2020
Paul Liang (visiting FAIR from CMU)	2020
Phillip Wang (at CMU, now: CEO at Gather)	2018

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

Programming	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, git, tmux, zsh