

Sébastien M. R. Arnold

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Education

Ph.D. Computer Science

University of Southern California, Los Angeles, CA, USA

August 2017 - December 2022
(expected)

B.Sc. Computer Science (with honors)

B.A. Mathematics (with honors)

University of Southern California, Los Angeles, CA, USA

August 2014 - August 2017

Experience

Sha Lab - USC

Doctoral Candidate - Advisor: Prof. Fei Sha

Topic: Inductive biases for multi-task, transfer, and meta-learning. See: [P1](#), [P3](#), [P4](#), [P5](#) [T1](#), [T3](#)

August 2017 - Present

Prime Economics - Amazon

Applied Scientist Intern - Manager: Dr. Charlie Manzanares

Project: Learning causal representations with weak contextual instruments.

May 2021 - August 2021

AWS AI - Amazon

Applied Scientist Intern - Manager: Dr. Avinash Ravichandran

Project: Episodic sampling for meta-learning. See: [P2](#)

May 2020 - August 2020

Mila - U. de Montreal

Visiting Ph.D. Researcher - Host: Prof. Ioannis Mitliagkas

Topic: Variance reduction in online stochastic optimization. See: [P6](#), [T2](#)

June 2018 - September 2018

Brain-Body Dynamics Lab - USC

Undergraduate Researcher - Advisor: Prof. Francisco Valero-Cuevas

Topic: Reinforcement learning for simulated, robotic, and cadaveric continual control. See: [P10](#), [M1](#)

July 2016 - August 2017

Simulation and Modelling Lab - USC

Undergraduate Researcher - Advisor: Prof. Chunming Wang

Topic: Second-order optimization methods for distributed deep learning. See: [P9](#)

April 2016 - August 2017

Intel Nervana

Algorithm Intern - Manager: Dr. Arjun Bansal

Project: Lead development of internal distributed deep learning library for [neon](#).

August 2015 - August 2016

Selected Publications {available on [Semantic Scholar](#)}

P1 Quasi Monte-Carlo Policy Gradients

S.M.R. Arnold, L. Chen, Y-F. Chen, P. L'Ecuyer, F. Sha, 2021, In submission

P2 Uniform Sampling over Episode Difficulty

S.M.R. Arnold, G. S. Dhillon, A. Ravichandran, S. Soatto, 2021, NeurIPS, Spotlight (Top 3%)

P3 Embedding Adaptation Is Still Required For Few-Shot Learning

S.M.R. Arnold, F. Sha, 2021, In submission

P4 learn2learn: A Library for Meta-Learning Research

S.M.R. Arnold, P. Mahajan, D. Datta, I. Bunner, K.S. Zarkias, 2020, In submission

P5 When MAML Can Adapt Fast and How to Assist When It Cannot

S.M.R. Arnold, S. Iqbal, F. Sha, 2021, AISTATS

P6 Reducing the Variance in Online Optimization by Transporting Past Gradients

S.M.R. Arnold, P.-A. Manzagol, R. Babanezhad, I. Mitliagkas, N. Le Roux, 2019, NeurIPS, Spotlight (Top 3%)

P7 Understanding the Variance of Policy Gradient Estimators in Reinforcement Learning

S.M.R. Arnold, J.A. Preiss, C-Y. Wei, M. Kloft, 2019, SoCal ML Symposium, Best Poster Award

P8 Writing Distributed Applications with PyTorch

S.M.R. Arnold, 2017, PyTorch Tutorials, 200k+ Page Views (as of December 2020)

P9 Accelerating SGD for Distributed Deep Learning Using an Approximated Hessian Matrix

S.M.R. Arnold, C. Wang, 2017, ICLR Workshop

P10 Shapechanger: Environments for Transfer Learning

S.M.R. Arnold, T.K. Pun, T.J. Denisart, F.J. Valero-Cuevas, 2017, SoCal Robotics Symposium

Selected Talks {available [online](#)}

T1 To Transfer or To Adapt: A Study Through Few-Shot Learning

Invited Talk, *Amazon - Seattle, USA*, August 2021

Invited Talk, *Google - Mountain View, USA (Remote)*, April 2021

T2 Reducing the Variance in Online Optimization by Transporting Past Gradients

Spotlight, *NeurIPS - Vancouver, Canada*, December 2019

T3 learn2learn: A Meta-Learning Framework for Researchers

Invited Talk, *Pytorch Dev Conference - San Francisco, USA*, October 2019

T4 Introduction to Modern Reinforcement Learning

Guest Lecture, *CSCI467, USC - Los Angeles, USA*, November 2018

Selected Software {available on [GitHub](#)}

learn2learn: A Library for Meta-Learning Research (Python, C/C++)

State-of-the-art implementation of algorithms & benchmarks for meta-learning research.

1st place at the Facebook PyTorch Summer Hackathon, 2019. 1.5k Stars, 18 Contributors.

Website: learn2learn.net GitHub: [learnables/learn2learn](https://github.com/learnables/learn2learn) ArXiv: [abs/2008.12284](https://arxiv.org/abs/2008.12284)

Professional Service

Reviewer for ICLR'22, NeurIPS'21, ICML'21, CVPR'21, AISTATS'21, ICCV'21, IEEE TSP'20, JOSS'20, '21.

Selected Awards

NeurIPS'21 Outstanding Reviewer Award	Top 8% of reviewers.	2021
East European ML Summer School	Best Theory Poster	2019
USC Award for Excellence in Mathematics	Honorable Mention (2 nd in Mathematics Department)	2017
USC Undergraduate Research Project	2 nd Place in Mathematics, Physics, and Engineering Departments	2017
David Wiesen Scholarship	Recipient	2016
Microsoft Tuition Scholarship	Finalist	2016
USC Provost Research Fellowship	Recipient	2015, 2016
USC Viterbi Dean's List		2014, 2015, 2016

Press Coverage

M1 **The Quest To Make A Robotic Cat Walk with Artificial Neurons** by M. Simon, [WIRED](#), March 2018

Mentoring

Jayasurya Sridharan – USC Computer Science B.Sc. *May 2019 - August 2019*
Project: Parallel and Differentiable Simulation of UAVs.

Ian Bunner – USC Quantitative Biology B.Sc. *December 2018 - September 2019*
Project: Off-Policy Meta-Reinforcement Learning.

Darío Urbina – USC Biomedical Engineering Ph.D. *January 2018 - May 2018*
Project: Reinforcement Learning for Tendon-driven Quadruped Locomotion.

References and curriculum vitae are available upon request.