Sébastien M. R. Arnold

smr.arnold@gmail.com   sebarnold.net

Education

Ph. D. Computer Science   *August 2017 - May 2023*
University of Southern California, Los Angeles, CA, USA

B. Sc. Computer Science (*with honors*)   *August 2014 - August 2017*
B. A. Mathematics (*with honors*)
University of Southern California, Los Angeles, CA, USA

Experience

Google Research   *July 2023 - Present*
Software Engineer - Manager: Dr. Nan Hua

USC Machine Learning Lab   *August 2017 - May 2023*
Doctoral Candidate - Advisor: Prof. Fei Sha
Topic: Inductive biases for multi-task, transfer, and meta-learning. See: P2, P3, P4, P6, P7, P8, T1, T2, T4, T6

Google Research   *May 2022 - August 2022*
Research Intern - Manager: Dr. Ice Pasupat
Project: Meta-learning for large language models.

Amazon Prime Economics   *May 2021 - August 2021*
Applied Scientist Intern - Manager: Dr. Charlie Manzanares
Project: Learning causal representations with weak contextual instruments.

Amazon AWS AI   *May 2020 - August 2020*
Applied Scientist Intern - Manager: Dr. Avinash Ravichandran
Project: Episodic sampling for meta-learning. See: P5, T3

Mila - U. de Montreal   *June 2018 - September 2018*
Visiting Ph.D. Researcher - Host: Prof. Ioannis Mitliagkas
Topic: Variance reduction in online stochastic optimization. See: P9, T5

USC Brain-Body Dynamics Lab   *July 2016 - August 2017*
Undergraduate Researcher - Advisor: Prof. Francisco Valero-Cuevas
Topic: Reinforcement learning for simulated, robotic, and cadaveric continuous control. See: P13, M2

USC Simulation and Modelling Lab   *April 2016 - August 2017*
Undergraduate Researcher - Advisor: Prof. Chunming Wang
Topic: Second-order optimization methods for distributed deep learning. See: P12

Nervana Systems (Intel)   *August 2015 - August 2016*
Algorithm Intern - Manager: Dr. Arjun Bansal
Project: Lead development of internal distributed deep learning library for neon.

Selected Publications available on Semantic Scholar

P1 **RoboCLIP: One Demonstration is Enough to Learn Robot Policies**
S. A. Sontakke, S. M. R. Arnold, J. Zhang, K. Pertsch, E. Biyik, D. Sadigh, C. Finn, L. Itti, *NeurIPS*, 2023

P2 **Policy-Induced Self-Supervision Improves Representation Finetuning in Visual RL**
S. M. R. Arnold, F. Sha, *ArXiv Preprints*, 2023

P3 **A Domain-Agnostic Approach for Characterization of Lifelong Learning Systems**
M. M. Baker et al. (47 authors), *Neural Networks*, 2023

P4 **Policy Learning and Evaluation with Randomized Quasi-Monte Carlo**
S. M. R. Arnold, L. Chen, Y-F. Chen, P. L'Ecuyer, F. Sha, *AISTATS*, 2022

P5 **Uniform Sampling over Episode Difficulty**
S. M. R. Arnold, G. S. Dhillon, A. Ravichandran, S. Soatto, *NeurIPS*, 2021, **Spotlight (Top 3%)**

P6 **Embedding Adaptation Is Still Required For Few-Shot Learning**
S. M. R. Arnold, F. Sha, *ArXiv Preprints*, 2021

P7 **learn2learn: A Library for Meta-Learning Research**
S. M. R. Arnold, P. Mahajan, D. Datta, I. Bunner, K. S. Zarkias, *ArXiv Preprints*, 2020

P8 **When MAML Can Adapt Fast and How to Assist When It Cannot**
S. M. R. Arnold, S. Iqbal, F. Sha, *AISTATS*, 2021

P9 **Reducing the Variance in Online Optimization by Transporting Past Gradients**
S. M. R. Arnold, P.-A. Manzagol, R. Babanezhad, I. Mitliagkas, N. Le Roux, *NeurIPS*, 2019, **Spotlight (Top 3%)**

P10 **Understanding the Variance of Policy Gradient Estimators in Reinforcement Learning**
S. M. R. Arnold, J. A. Preiss, C-Y. Wei, M. Kloft, *SoCal ML Symposium*, 2019, **Best Poster Award**

P11 **Writing Distributed Applications with PyTorch**
S. M. R. Arnold, *PyTorch Tutorials*, 2017, **200k+ Page Views** (as of December 2020)

P12 **Accelerating SGD for Distributed Deep Learning Using an Approximated Hessian Matrix**
S. M. R. Arnold, C. Wang, *ICLR Workshop*, 2017

P13 **Shapechanger: Environments for Transfer Learning**
S. M. R. Arnold, T. K. Pun, T. J. Denisart, F. J. Valero-Cuevas, *SoCal Robotics Symposium*, 2017

Selected Talks available online

T1 **Quickly Solving New Tasks, With Meta-Learning and Without**
Thesis Defense, *University of Southern California - Los Angeles, USA*, December 2022
Invited Talk, *JPMorgan Chase - New York, USA (Remote)*, March 2023
Invited Talk, *Roche - Basel, Switzerland (Remote)*, March 2023

T2 **The Importance of Depth in Meta-Learning**
Invited Talk, *Cohere - Toronto, Canada (Remote)*, November 2022
Invited Talk, *OpenAI - San Francisco, USA (Remote)*, October 2022

T3 **Uniform Sampling over Episode Difficulty**
Spotlight, *EPFL's NeurIPS Mirror Event - Lausanne, Switzerland*, December 2021

T4 **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

T5 **Reducing the Variance in Online Optimization by Transporting Past Gradients**
Spotlight, *NeurIPS - Vancouver, Canada*, December 2019

T6 **learn2learn: A Meta-Learning Framework for Researchers**
Invited Talk, *Pytorch Dev Conference - San Francisco, USA*, October 2020

T7 **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. **2.3k** Stars, **30** Contributors.
Website: learn2learn.net   GitHub: learnables/learn2learn   ArXiv: abs/2008.12284

Professional Service

Reviewer for AISTATS, CVPR, ICCV, ICLR, ICML, IEEE TSP, JOSS, NeurIPS, TMLR

Selected Awards

Google Research Award $12,300 for research on Google Cloud Platform	*2022*
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 (2nd in Mathematics Department)	*2017*
USC Undergraduate Research Project 2nd 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 Recipient	*2014, 2015, 2016*

Press Coverage

M1	**For gifted students, USC initiative fosters summer learning** *by D. Krieger*, USC News	*August 2019*
M2	**The Quest To Make A Robotic Cat Walk with Artificial Neurons** *by M. Simon*, WIRED	*March 2018*

References are available upon request.