

# Sébastien M. R. Arnold

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## Education

### Ph.D. Computer Science

University of Southern California

August 2017 - Present

### BS. Computer Science & BA. Mathematics (with honors)

University of Southern California

August 2014 - August 2017

### BS. Computer Science (dropout)

ETH Zürich

September 2011 - August 2013

### High-School Summer Semester

Stanford University

June 2011 - August 2011

### Maturité Fédérale

Gymnase Auguste-Piccard

August 2008 - August 2011

## Research

### Shalab - USC

August 2017 - Present

Doctoral Student - Advisor: Prof. Fei Sha

Research topic: Optimization and Reinforcement Learning.

### Mila - U. de Montreal

June 2018 - September 2018

Visiting Researcher - Host: Prof. Ioannis Mitliagkas

Research topic: Variance reduction in online stochastic optimization.

### Brain-Body Dynamics Lab - USC

July 2016 - August 2017

Undergraduate Researcher - Advisor: Prof. Francisco Valero-Cuevas

Investigating deep reinforcement learning algorithms for simulated, robotic, and cadaveric hand control.

### Simulation and Modelling Lab - USC

April 2016 - August 2017

Undergraduate Researcher - Advisor: Prof. Chunming Wang

Investigating second order optimization methods for distributed deep learning.

**Information Science Institute - USC****January 2015 - December 2015****Research Assistant - Advisors: Prof. Greg Ver Steeg, Prof. Itay Hen**

Comparison of classical and adiabatic quantum optimization of Ising models, and introduction to quantum machine learning.

**Computational Social Science - ETHZ****June 2012 - January 2014****Research Assistant - Advisor: Dr. Stefano Ballelli**

Development of multi-user, real-time sociological experiments. Project received appraisal from the European Commission and fundings for coming years.

**Industry****Nervana Systems****August 2015 - August 2016****Algorithm Intern - Advisor: Dr. Arjun Bansal**

Development of distributed deep learning library and research project in distributed deep reinforcement learning.

**Schneeberger AG****May 2014 - November 2014****Lead Engineer**

Development of a financial management tool for an international usage. Engineering leader in a team of 4.

**Tooski****January 2009 - Present****Founder**

Development of the leading French-speaking skiing website, and its magazine *Angulation*.

**Teaching****University of Southern California****Fall 2018****Teaching assistant**

Leading discussion sections, designing project assignments and exams, and a guest lecture on reinforcement learning.

**Writings**

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

**Writing Distributed Applications with PyTorch** S. Arnold, 2017, PyTorch Tutorials

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

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

**A Performance Comparison between TRPO and CEM for Reinforcement Learning** *S. Arnold, E. Chu, F. Valero-Cuevas*, 2016, SoCal ML Symposium

**A Greedy Algorithm to Cluster Specialists** *S. Arnold*, Technical Report, 2016, Arxiv Preprint

## **Presentations**

**Introduction to Reinforcement Learning** *S. Arnold*, Guest Lecture, 2018, CSCI467, USC - Los Angeles

**Managing Machine Learning Experiments** *S. Arnold*, Talk, 2018, SoCal Python Meetup - Los Angeles

**Managing Machine Learning Experiments** *S. Arnold*, Talk, 2018, Fund3 - Hong Kong

**Optimization and Policy Gradients** *S. Arnold*, Talk, 2017, Fund3 - Los Angeles

## **Press**

**The Quest To Make A Robotic Cat Walk with Artificial Neurons** *M. Simon*, WIRED, March 2018

## **Awards**

- **USC Senior Award for Excellence in Mathematics**: Honorable Mention, 2017
- **USC Undergraduate Research Project**: 2<sup>nd</sup> Place in Mathematics, Physics, and Engineering, 2017
- **David Wiesen Scholarship**: 2016
- **USC Summer Undergraduate Research Fellowship**: 2016
- **Microsoft Tuition Scholarship**: Finalist, 2016
- **USC Academic Achievement Award**: 2015, 2016
- **USC Provost Research Fellowship**: 2015, 2016
- **USC Dean's List**: 2014, 2015, 2016
- **HackSC Winner - Microsoft Category**: 2014

## **Memberships**

- Society of Women in Engineering, USC Chapter

## **Languages**

- **Bilingual**: French, Italian
- **Proficient**: English, German
- **Basic**: Spanish

## Interests

- **Ski:** Throughout my highschool and part of my university studies, I was lucky to race across the Alps on the FIS circuit with the best regional Swiss skiers. This longstanding passion spawned Tooski, and I was once ranked among the best 2'000 racers worldwide.
- **Mathematics:** I am generally interested in mathematics, and more specifically in optimization and stochastic models. I like to apply them to all kinds of problems, especially the ones related to artificial intelligence.
- **Computing:** I have been programming since my early teens, and have studied different computational hardwares such as GPUs, D-Wave, and HPC clusters.