

Tyler LaBonte

Undergraduate Researcher
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Research Interests

Mathematical Foundations of Machine Learning and Data Science

Theory of Deep Learning and Deep Reinforcement Learning
Online Learning and Bandit Problems
Non-Convex Optimization and High-Dimensional Statistics
Explainability, Fairness, Robustness, and Scalability of Machine Learning

Education

University of Southern California	2017–2021
<i>Bachelor of Science, Applied and Computational Mathematics</i>	GPA: 3.73/4.0
<i>Minor in Computer Science</i>	w/o PhD courses: 3.83/4.0

PhD courses (taken as an undergraduate):

CSCI 670: Advanced Analysis of Algorithms
CSCI 671: Randomized Algorithms
CSCI 672: Approximation Algorithms
CSCI 675: Convex and Combinatorial Optimization

Research Experience

X, the moonshot factory (formerly Google X)	Mountain View, CA
<i>Machine Learning Research Intern</i>	2020
<i>Advisor: Daniel Ribeiro Silva</i>	
Invented deep learning architecture for temporal identity preservation in object tracking.	

Sandia National Laboratories	Albuquerque, NM
<i>Machine Learning Research Intern</i>	2019–2020
<i>Advisors: Carianne Martinez and Scott A. Roberts</i>	
Invented novel Bayesian deep learning architecture for credible geometric uncertainty.	

University of Southern California	Los Angeles, CA
<i>Machine Learning Undergraduate Researcher</i>	2019
<i>Advisor: Prof. Jason D. Lee</i>	
Investigated generalization and linearization of overparameterized deep neural networks.	

University of Southern California
Mechanism Design Undergraduate Researcher
 Advisor: Prof. David Kempe

Los Angeles, CA
 2018

Investigated distortion bounds in limited-communication metric voting.

Air Force Research Laboratory
Machine Learning Research Intern
 Advisor: Capt. Justin Fletcher, USAF

Kihei, HI
 2018

Developed methodology for decoupling deep learning development and deployment.

Publications

PREPRINTS

1. **T. LaBonte**, C. Martinez, and S. A. Roberts. We Know Where We Don't Know: 3D Bayesian CNNs for Credible Geometric Uncertainty. Under submission to WACV 2021. <https://arxiv.org/abs/1910.10793>.

CONFERENCE ARTICLES

1. C. Norris, **T. LaBonte**, C. Martinez, S. A. Roberts, and P. P. Mukerjee. Effective Property Uncertainty of Graphite Electrodes from Computed Tomography Using Bayesian Convolutional Neural Networks. *To appear in ECS Transactions 2020*. Conference cancelled due to COVID-19. <https://iopscience.iop.org/article/10.1149/MA2020-012448mtgabs>.

ACKNOWLEDGMENTS

1. D. Kempe. Communication, Distortion, and Randomness in Metric Voting. In *Proceedings of AAAI 2020*. <https://arxiv.org/abs/1911.08129>.

Awards

U.S.S. Bowfin Memorial Scholarship (\$5,000)	2020
SIMLR Award for Outstanding Intern – TOP ML INTERN AT SANDIA NATIONAL LABORATORIES	2020
1 st Place Computer Vision Project – TREEHACKS, STANFORD UNIVERSITY	2019
1 st Place Healthcare AI Project – TREEHACKS, STANFORD UNIVERSITY	2019
1 st Place Data Analytics Project – HACKSC, USC	2019
Admiral Bernard Clarey Memorial Scholarship (\$7,000)	2018
National Top 20 Ethical Hacking Finalist – MAJOR LEAGUE HACKING	2018
USC Trustee Scholar (\$250,000)	2017
USC Viterbi Fellow (\$24,000)	2017
Dolphin Scholarship (\$13,600)	2017
Rear Admiral Paul Lacy Memorial Scholarship (\$6,500)	2017

National Merit Scholar (\$3,000)

2017

Open Source Software

1. BCNN: 3D Bayesian CNNs for credible geometric uncertainty 2019–2020
<https://github.com/sandialabs/bcnn> ★ 23 ♪ 5
 Transitioned to a production environment by Sandia National Laboratories
2. Tendies: Decoupling deep learning development and deployment 2018
<https://github.com/tmlabonte/tendies> ★ 32 ♪ 9
 Transitioned to a production environment by the Air Force Research Laboratory

Teaching

1. Curriculum Lead | USC Center for Artificial Intelligence in Society 2019
 Introduction to Machine Learning
2. Undergraduate Teaching Assistant | University of Southern California 2018
 CSCI 170: Discrete Methods in Computer Science

Invited Talks

1. USC Theory Group – LOS ANGELES, CA 2019
 3D Bayesian CNNs for Credible Geometric Uncertainty
2. USC Center for Artificial Intelligence in Society – LOS ANGELES, CA 2019
 3D Bayesian CNNs for Credible Geometric Uncertainty