Tyler LaBonte

Undergraduate Researcher
University of Southern California
Department of Computer Science
Los Angeles, CA

tlabonte@usc.edu
https://tmlabonte.github.io
https://github.com/tmlabonte
https://linkedin.com/in/tmlabonte
https://medium.com/@tmlabonte

Research Interests

Mathematical Foundations of Machine Learning
Generalization Theory of Deep Learning
Convex and Non-Convex Optimization
Online Learning and Bandit Problems

Education

University of Southern California — 2017–2021
Bachelor of Science, Applied and Computational Mathematics — GPA: 3.73/4.0
Minor in Computer Science — 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

University of Southern California — Los Angeles, CA
Convex Optimization Undergraduate Researcher — 2020–
Advisor: Prof. Shaddin Dughmi
Investigated impact of approximate separation oracles on solvability of linear programs.

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

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

University of Southern California — Los Angeles, CA
Machine Learning Undergraduate Researcher — 2019

Advisor: Prof. Jason D. Lee
Investigated generalization and linearization of overparameterized deep neural networks.

University of Southern California — Los Angeles, CA
Mechanism Design Undergraduate Researcher — 2018
Advisor: Prof. David Kempe
Investigated distortion bounds in limited-communication metric voting.

Air Force Research Laboratory — Kihei, HI
Machine Learning Research Intern — 2018
Advisor: Capt. Justin Fletcher, USAF
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 – SANDIA NATIONAL LABORATORIES — 2020

1st Place Computer Vision Project – TREEHACKS, STANFORD UNIVERSITY — 2019

1st Place Healthcare AI Project – TREEHACKS, STANFORD UNIVERSITY — 2019

1st 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