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 — Los Angeles, CA
Bachelor of Science, Applied and Computational Mathematics — 2017–2021
Minor in Computer Science — GPA: 3.75/4.0

PhD courses (taken as an undergraduate):

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

Research Experience

X, the moonshot factory (formerly Google X) — Mountain View, CA
Machine Learning Research Intern — 2020–
Advisor: Daniel Ribeiro Silva

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 ECCV 2020. https://arxiv.org/abs/1910.10793.

ACKNOWLEDGMENTS

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

Awards

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` ★ 16 ⑂ 4
   Transitioned to a production environment by Sandia National Laboratories
2. Tendies: Decoupling deep learning development and deployment 2018
   `https://github.com/tmlabonte/tendies` ★ 31 ⑂ 8
   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