Eric W. Todd

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EDUCATION

PhD, Computer Science   Sep 2022 - Present
Northeastern University – Khoury College   Boston, MA
Advisor: David Bau
Research Areas: Interpretable Machine Learning, Natural Language Processing, Computer Vision

MS, Computer Science   Aug 2022, Incomplete
Brigham Young University – GPA: 4.00/4.00   Provo, UT
Advisor: Ryan Farrell
Note: Incomplete - left to pursue PhD

BS, Applied and Computational Mathematics, Summa Cum Laude   Apr 2020
Brigham Young University – GPA: 4.00/4.00   Provo, UT
Minors: Computer Science, Statistics

WORK EXPERIENCE

Graduate Research Assistant   Sep 2022 – Present
Northeastern University – Interpretable Neural Networks Lab   Boston, MA
- Researching internal mechanisms of deep networks in natural language processing and computer vision

Graduate Research Assistant   Sep 2020 – Aug 2022
Brigham Young University – Computer Science Department   Provo, UT
- Researched unsupervised deep learning methods for part segmentation & overcoming occlusion, particularly in the context of fine-grained visual classification (FGVC)

Research Intern   May 2022 – Aug 2022
Wright State University ATRC   Remote
- AFRL Mentor: Oliver Nina
- Researched self-supervised learning methods for fine-grained image classification.

Undergraduate Research Assistant   Feb 2018 – Aug 2020
Brigham Young University – Physics Department   Provo, UT
- Co-authored 2 academic publications (1 first author) related to classifying crowd behavior using crowd noise data collected from BYU basketball games & a Mardi Gras parade.
- Applied machine learning methods to crowd noise datasets to discover and classify crowd behavior.
- Developed the data visualization process used to understand and interpret spectral clustering results.
- Integrated audio feature processing into custom data pipeline for feature engineering & validation.
- Collected audio data at 25+ BYU sporting events and helped establish audio data labeling guidelines.

Machine Learning Intern   May 2019 – Aug 2019
Brigham Young University – Enrollment Services   Provo, UT
- Expanded and improved a Python machine learning model to successfully predict academic failure for all BYU students in early weeks of the semester. The product is known as **Early Alert** and is used by most campus support offices to provide individualized support for students.
- Reduced model training time 2x through code profiling and optimization
- Daily tasks included data cleaning, data storage and retrieval using SQL, feature engineering, feature selection, algorithm optimization, and model evaluation.

TEACHING EXPERIENCE

Undergraduate Teaching Assistant

Brigham Young University – Department of Mathematics   Provo, UT
- Introduction to Mathematical Python (Math 495R) – Winter 2019
- Algorithm Design and Optimization 1 Lab (Math 321) – Fall 2019
- Mathematical Analysis 1 Lab (Math 345) – Fall 2019
- Algorithm Design and Optimization 2 Lab (Math 323) – Winter 2020
- Mathematical Analysis 2 Lab (Math 347) – Winter 2020

Graduate Teaching Assistant

Brigham Young University – Computer Science Department   Provo, UT
- Deep Learning (CS 474) – Fall 2021
- Introduction to Machine Learning (CS 472) – Winter 2021, Summer 2021
- Computer Vision (CS 450) – Winter 2022

PUBLICATIONS

Peer-Reviewed Conference Publications

2. **Eric Todd**, Mylan R. Cook, Katrina Pedersen, David S. Woolworth, Brooks A. Butler, Xin Zhao, Colt Liu, Kent L. Gee, Mark K. Transtrum, Sean Warnick, "Automatic detection of instances of focused crowd involvement at recreational events", Proceedings of Meetings on Acoustics 39, 040003 (2019); https://doi.org/10.1121/2.0001327

1. Brooks A. Butler, Katrina Pedersen, Mylan R. Cook, Spencer G. Wadsworth, **Eric Todd,** Dallen Stark, Kent L. Gee, Mark K. Transtrum, Sean Warnick, "Classifying crowd behavior at collegiate basketball games using acoustic data*",* Proceedings of Meetings on Acoustics 35, 055006 (2018); https://doi.org/10.1121/2.0001061

PRESENTATIONS

- BYU CPMS Student Research Conference, BYU, Provo, Utah, March 2019, "Unsupervised classification of crowd noise at BYU basketball games", (Co-Presenter: Brooks Butler)
- BYU CPMS Student Research Conference, BYU, Provo, Utah, March 2018, "Modeling Crowd Noise with Machine Learning"

Co-Authored Presentations
- Acoustical Society of America Meeting, San Diego, California, December 2019, "Detecting instances of focused crowd involvement at recreational events" (Presenter: Mylan R. Cook); https://doi.org/10.1121/1.5136792
- Acoustical Society of America Meeting, San Diego, California, December 2019, "Feature reduction of crowd noise used for machine learning classification", (Presenter: Brooks Butler); https://doi.org/10.1121/1.5137086
- Acoustical Society of America Meeting, Louisville, Kentucky, May 2019, "Improved automated classification of basketball crowd noise", (Presenter: Mylan R. Cook); https://doi.org/10.1121/1.5101637
- Acoustical Society of America Meeting, Victoria, BC, Canada, November 2018, "Clustering analysis of crowd noise from collegiate basketball games", (Presenter: Brooks Butler); https://doi.org/10.1121/1.5067673

HONORS AND AWARDS

Brigham Young University
- Utah Regents Scholarship (2014-2015, 2017-2018)
- Brigham Young Scholarship (Full Tuition Academic Scholarship: 2014-2015, 2017-2020)
- College of Physical and Mathematical Sciences Dean's List (Top 5% of the college, 2017-2020)
- Outstanding Performance in Mathematics Award (Apr 2020)
- Warren Rollins and Murdell Hull Scholarship (Apr 2020)
- President's Leadership Council Presentation (Selected by faculty to represent my college's 4000+ students by presenting my internship work on Early Alert to BYU's $1M+ donors and top administration) (Oct 2020)