

Jeri Luckenbaugh, (She/They)

Signal Processing, Machine Learning, Dynamical Systems

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Education

B.S. in Mathematics & B.S. in Electrical Engineering, GPA: 3.88 / 4.00 (*Magna Cum Laude*) Fall 2021

The University of Texas at Dallas (UTD) – Richardson, Texas

- Mathematics curriculum includes numerical analysis, stochastic processes, differential geometry, algebra, and analysis.
- Engineering curriculum includes information theory, Hilbert space approximation, systems, controls, filters, and combinatorics.

Experience

Research Experience for Undergraduates, Southern Methodist University – Mathematics July-Aug 2021

Dallas, Texas

- Projects on mathematical modeling in computational neuroscience and nonlinear dynamics.
- Employ MATLAB for numerical PDE simulation and constructions of models for hippocampal brain cells and oscillator networks.

Project Lead, UDesign – Team 1145: Deepcut, a Robot that Raps 2020–2021

Richardson, Texas

- Led team of 6 engineers to yield a musical performance robot that creates rapped vocals and plausible movements from text.
- Vocal synthesizer implemented with deep learning-based, autoregressive speech generation and force-alignment toolkits.
- Server communicates wirelessly with edge device (robot) based on a Raspberry Pi 4B SBC for performance.

Undergraduate Research Assistant, UTD – Multimodal Signal Processing (MSP) Laboratory 2019–2021

Richardson, Texas

- Research in voice activity detection (VAD), speech enhancement (SE) for speech emotion recognition (SER).
- Implement and train deep learning-based models in Python for noise robustness in speech systems.
- Perform data cleaning, annotation, feature engineering, and data analytics for SER corpus and medical data.

Publications

[1] Voice Activity Detection with Teacher-Student Domain Emulation

J. Luckenbaugh, S. Abplanalp, R. Gonzalez, D. Fulford, D. Gard, C. Busso
Interspeech (2021, DOI: 10.21437/Interspeech.2021-1234)

[2] Smartphone sensing of social interactions in people with and without schizophrenia

D. Fulford, J. Mote, R. Gonzalez, S. Abplanalp, Y. Zhang, J. Luckenbaugh, J.P. Onnela, C. Busso, D.E. Gard
Journal of Psychiatric Research (2020, DOI: 10.1016/j.jpsychires.2020.11.002)

Teaching

Head Tutor, Signals and Systems 2020–Present

- Organize and lead review sessions for the undergraduate course EE 3302 at UTD. Assist with walk-in tutoring.

Tutor, Digital Circuits, Electrical Network Analysis, Intro to EE 2020–Present

- Assist with walk-in tutoring for the undergraduate courses EE 3301, EE 3320, and EE 1202 at UTD.

Undergraduate Learning Assistant, Calculus of Several Variables Fall 2020

- Co-directed problem sections for the undergraduate course MATH 2415 at UTD.

Awards

SIAM Texas-Louisiana Section - Student Travel Award Fall 2021

- \$500 award granted for the presentation of "Coupled Oscillators and Hysteresis in Sparse Networks."

UTDesign ECE Expo - Best Student Project Spring 2021

- First place awarded to Team 1145 for the project "Deepcut: A Robot that Raps."

- UTD - Undergraduate Research Scholar Award** Spring 2021
 - \$500 award granted for the presentation of "Voice Activity Detection with Teacher-Student Domain Emulation."
- IEEE - Eta Kappa Nu (HKN) Honor Society** Spring 2019
 - Lifetime membership granted based on academic achievement and service.
- UTD - Academic Excellence Scholarship** 2017 - 2021
 - \$24,000 award granted for use on tuition based on academic merit.

Presentations

- Poster: Coupled Oscillators and Hysteresis in Sparse Networks** 11/06/2021
 4th Annual SIAM Texas-Louisiana Section Meeting
- Invited Talk: Coupled Oscillators and Hysteresis in Sparse Networks** 10/08/2021
 UTD - Computational Science Seminar
- Invited Talk: Voice Activity Detection with Teacher-Student Domain Emulation** 09/03/2021
 Interspeech 2021
- Poster: Deepcut - A Robot that Raps** 05/07/2021
 UTDesign ECE Expo Spring 2021 (*Best Student Project*)
- Poster: Voice Activity Detection with Teacher-Student Domain Emulation** Canceled due to COVID-19
 Undergraduate Research Scholar Award Poster Competition

Workshops

- O4U – Technology and Engineering Conference** Oct 2021
 - Workshops on leadership and navigating diverse identities in industrial and academic environments.
- Georgia Institute of Technology – Excitable Systems Workshop** July 2021
 - Workshop on dynamical systems with applications in biology.
- University of Texas at Austin – Summer Program in PDEs** May 2021
 - Workshop on the calculus of variations and distributions with talks on geometric analysis and well-posedness.

Service and Outreach

- Florence Nightingale Day 2021**, UTD – Mathematical Sciences 10/23/2021
 - Organizer at event for grades 8-12 by faculty at OSU/UTD to increase representation of women and minorities in data science.
- UT Dallas Engineering Day Workshop 2020**, UTD – Electrical and Computer Engineering 02/15/2020
 - Hosted workshop for grades 6-12 on electronic components and soldering to construct an optical heartrate monitor.

Skills

Programming, Languages include Python, Java, C/C++, MATLAB, Mathematica, and LaTeX.

Machine Learning, Libraries include Pytorch, TensorFlow, Keras, skikit-learn, and NumPy.

Other Software, Workflow includes git, Jupyter notebook, Unix, Kaldi-ASR, and Praat.

Hardware, Topics include, Filter Design, Programmable Logic Devices, Audio Circuitry, and Soldering.

Activities

Active student membership in SIAM, IEEE, IEEE-HKN, and ISCA-Speech