Matthew K. Perez

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RESEARCH INTEREST

My research is currently focused on speech-based methods for characterizing human health and behavior. I'm fascinated by the vast information encoded in a speech signal and ultimately how this can be leveraged to provide feedback for an individual, clinicians, and/or AI driven devices. My work has covered topic areas such as automatic speech recognition, acoustic feature analysis, and computational paralinguistics.

EDUCATION

University of Michigan, Ann Arbor 2017 – 2023 (*expected)*
Ph.D. in Computer Science and Engineering
Advisor: Dr. Emily Mower Provost

University of Michigan, Ann Arbor 2017 – 2019
M.S. in Computer Science and Engineering
Advisor: Dr. Emily Mower Provost

University of Notre Dame 2013 – 2017
B.S. in Computer Science, *Cum Laude*

AWARDS

NSF Graduate Research Fellowship (GRFP) 2020 – 2023
GEM Ph.D. Engineering Fellowship 2019 – 2020
Dean's List, University of Notre Dame 2015 – 2017
Balfour-Hesburgh Scholar, University of Notre Dame 2013 – 2017

RESEARCH EXPERIENCE

Computational Human Artificial Intelligence (CHAI) Lab 2017 – Present
University of Michigan Ann Arbor, MI
Working on speech and signal processing methods for analyzing various neurological conditions.

Research Assistant: Weninger Research Group 2016
University of Notre Dame Notre Dame, IN
Utilized data mining techniques to study social media posts following the 2016 Presidential Election.

Research Assistant: Mobile Computing Lab 2015-2016
University of Notre Dame Notre Dame, IN
Investigated speech analysis methods for classifying mild traumatic brain injuries (concussions).

PUBLICATIONS

Matthew Perez, Amrit Romana, Noelle Carlozzi, Praveen Dayalu, Jennifer Ann Miner, Angela Roberts, and Emily Mower Provost. "Articulatory Coordination for Speech Motor Tracking in Huntington Disease" INTERSPEECH 2021. (*oral presentation*)

Amrit Romana, John Bandon, **Matthew Perez**, Stephanie Gutierrez, Richard Richter, Angela Roberts, Emily Mower Provost. "Automatically Detecting Errors and Disfluencies in Read Speech to Predict Cognitive Impairment in People with Parkinson's Disease". INTERSPEECH 2021 (oral presentation)

Zakaria Aldeneh, **Matthew Perez**, and Emily Mower Provost. "Learning Paralinguistic Features from Audiobooks through Style Voice Conversion" NAACL 2021. (v*irtual presentation*)

Matthew Perez, Zakaria Aldeneh, and Emily Mower Provost. "Aphasic Speech Recognition using a Mixture of Speech Intelligibility Experts" INTERSPEECH 2020. (*virtual presentation*)

Matthew Perez, Wenyu Jin, Duc Le, Noelle Carlozzi, Praveen Dayalu, Angela Roberts, and Emily Mower Provost. "Classification of Huntington's Disease Using Acoustic and Lexical Features." INTERSPEECH 2018. (*oral presentation*)

Louis Daudet, Nikhil Yadav, **Matthew Perez**, Christian Poellabauer, Sandra Schneider, Alan Huebner. "Portable mTBI Assessment Using Temporal and Frequency Analysis of Speech." IEEE Journal of Biomedical and Health Informatics 2017.

PROFESSIONAL EXPERIENCE

Research Intern 2021
Cogito Corporation Virtual
Worked on the Speech Signals team where I researched learning silence tokens within a language modeling framework (GloVe/BERT) for speech emotion recognition.

Research Scientist 2019
MIT Lincoln Laboratory Lexington, MA
Worked with Thomas Quatieri in the Bioengineering and Technologies Systems Group where my research focused on analyzing speech-based articulation features for neurological diseases such as depression.

iOS Developer Intern 2016
Garmin Olathe, KS
Contributed to the development of the Garmin iOS application, which syncs wearable device data to/from the iPhone. Specifically, implemented *Today Extensions* for the Garmin Connect Mobile app, which displays wearable health information like steps, activities, etc. I presented work to research teams and company executives.

Software Developer: ND Tours 2016
University of Notre Dame Notre Dame, IN
Developed mobile app using augmented reality that overlays the camera view with the history and information about specific landmarks. Coded in objective-c and uses firebase for backend location and data storage.

TALKS

Speech Intelligibility in Aphasic Speech Recognition Modeling 2020
The National GEM Consortium Technical Workshop, Virtual

Multimodal Classification of Huntington Disease, *Student Poster Award* 2018
Graduate Engineering Research Symposium, Ann Arbor

CONFERENCE ORGANIZATION

Reviewer, Affective Computing & Intelligent Interaction (ACII) 2021

Reviewer, Computer Speech & Language 2020

Poster Chair, Michigan AI Symposium 2019
University of Michigan, Ann Arbor

MEMBERSHIP

Member, International Speech Communication Association 2018 – Present
Member, IEEE 2016 – Present
National GEM Fellow 2019 – Present

SKILLS

Languages: Python, MATLAB, C++, Objective-C,
Speech Processing: Kaldi, Pytorch-kaldi, DeepSpeech, Librosa
Machine Learning: Pytorch, Keras, scikit-learn