



CENTER FOR  
HEALTHCARE ENGINEERING & PATIENT SAFETY  
UNIVERSITY OF MICHIGAN

## Providing Better Healthcare Through Systems Engineering: Seminars and Discussions

### Human-Centered Computing: Using Speech to Understand Behavior

*Emily Mower Provost, PhD*

Monday October 7 at 4:30PM in 1123 LBME



Engineering approaches to human behavior analysis are complicated by the lack of a one-to-one mapping between the behavioral cues that an individual generates and how an external observer interprets those cues. This many-to-many mapping injects noise into both the data and ground truth. As a result, many of the models and assumptions used in traditional machine learning and signal processing must be used with caveats or adapted to meet the needs of this domain. I will discuss our work on algorithmic approaches to characterize and predict how humans perceive signals that modulate spoken communication, focusing on emotion and mood. I will highlight our efforts in tracking mood for individuals with bipolar disorder. These technologies have the potential to forward diagnosis and treatment by providing constrained, repeatable, and easily modifiable assessment protocols, objective measures, and interaction scenarios.

**Emily Mower Provost** is an Associate Professor in Computer Science and Engineering at the University of Michigan. She received her Ph.D. in Electrical Engineering from the University of Southern California (USC), Los Angeles, CA in 2010. She is a member of Tau-Beta-Pi, Eta-Kappa-Nu, and a member of IEEE and ISCA. She has been awarded a National Science Foundation CAREER Award (2017), a National Science Foundation Graduate Research Fellowship (2004-2007), the Herbert Kunzel Engineering Fellowship from USC (2007-2008, 2010-2011), the Intel Research Fellowship (2008-2010), the Achievement Rewards For College Scientists (ARCS) Award (2009 – 2010), and the Oscar Stern Award for Depression Research (2015). She is a co-author on the paper, "Say Cheese vs. Smile: Reducing Speech-Related Variability for Facial Emotion Recognition," winner of Best Student Paper at ACM Multimedia, 2014, and a co-author of the winner of the Classifier Sub-Challenge event at the Interspeech 2009 emotion challenge. Her research interests are in human-centered speech and video processing, multimodal interfaces design, and speech-based assistive technology. The goals of her research are motivated by the complexities of the perception and expression of human behavior.

1123 LBME is room 1123 in the Ann & Robert H. Lurie Biomedical Engineering Building (LBME). The street address is 1101 Beal Avenue. A map and directions are available at: <http://www.bme.umich.edu/about/directions.php>.

This seminar series is presented by the U-M Center for Healthcare Engineering and Patient Safety (CHEPS): Our mission is to improve the safety and quality of healthcare delivery through a multi-disciplinary, systems-engineering approach.

For additional information and to be added to the weekly e-mail for the series, please contact [genekim@umich.edu](mailto:genekim@umich.edu).

Photographs and video taken at this event may be used to promote CHEPS, College of Engineering, and the University.