Preventing Domestic Violence Using Emotion Recognition in Speech

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Domestic violence is a serious social problem that affects millions each year. Because victims are often afraid to seek help, prevention and early detection of domestic violence is difficult. Our work is motivated by the potential for recent advances in technology to address this challenge. Emotion recognition has gained attention as a powerful tool for enhancing human-computer interactions in recent years. While emotion recognition from visual data such as facial expressions has been widely studied, emotion recognition from speech remains relatively unexplored. At the same time, advances in natural language processing and deep learning have led to widespread adoption of AI personal assistants. With the ability to measure the emotional state of a household, these AI assistants could potentially serve as risk barometers for domestic violence. In this research, we devise a novel prediction algorithm to recognize emotions from speech. We examine the non-text prosodic, acoustic, statistical, and spectral features of speech and develop a tiered neural network architecture to identify a speaker's emotional state with sample efficiency. We further investigate the effects of emotion intensity and temporal complexity. Our ultimate goal is to apply our algorithm toward the creation of a risk barometer.

Awards Won:
Acoustical Society of America: Third Award of $600.00, plus students Mentor will be awarded $150.
Samvid Education Foundation: Geno Third award