Automated Emotional Distress Severity Classification for Children and Adolescents Using Speech Emotion Recognition and AI

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Among the multitude of digital innovations to identify a biomarker for psychiatric diseases currently, as part of the macro-level digital health transformation, speech stands out as an attractive candidate with features such as affordability, non-invasive, and non-intrusive. TQI has developed a unique methodology, establishing a link between trauma, stress, and voice types partly related to the automatic nervous system changes, including disrupting speech-based characteristics.

The voice-based algorithm TQI is developing will be trained to understand behavioral and emotional tendencies and to anticipate future behaviors to determine if a child's vocal utterances deviate from age-appropriate linguistic and speech patterns. Improving long-standing mental health treatment outcomes disparities for youth from low-income communities requires innovative approaches to measuring the severity of emotional distress in developing personalized treatment plans.

The high rate of mental health issues for children and adolescents in low-income communities is partly driven by multiple trauma incidents. Exposure to trauma has a pernicious impact on the development of children and adolescents, including signs of attention span dysregulation, distractibility, and disorganized attachment. To this end, TQI is developing a one-of-a-kind proprietary clinical voice sample database and repository representing marginalized communities (African American, Latinx, and Caucasian) for developing a more accurate algorithm(s).

Biography

Desmond Caulley is a machine learning Ph.D. candidate at the Georgia Institute of Technology specializing in the area of speaker identification and speech recognition. His current research involves the automatic analysis of audio recordings from children with autism spectrum disorder to measure language progression and treatment effectiveness.

Dr. Alemu has over 20 years of experience as a psychologist, clinical supervisor, researcher, and administrator. He is an expert in digital mental healthcare and using technology to support precision and individualized treatment approaches to mental health treatment. TQI's digital mental health solutions address the stubborn disparities in mental health treatment outcomes.

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