



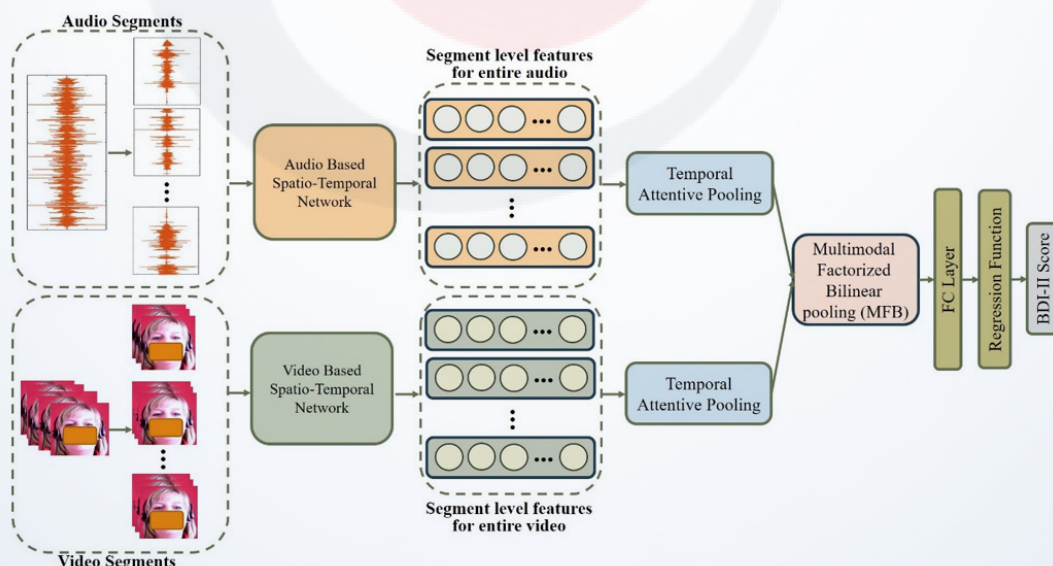
Deep Multi-Modal Network Based Automated Depression Severity Estimation

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Abstract

Depression is a severe mental illness that impairs a person's capacity to function normally in personal and professional life. The assessment of depression usually requires a comprehensive examination by an expert professional. However, this procedure is labor-intensive, lacks real-time measurements, and depends on subjective perception. Recently, machine learning-based automatic depression assessment has received considerable attention for a reliable and efficient depression diagnosis. Various techniques for automated depression detection were developed; however, certain concerns still need to be investigated. In this research, we introduce a novel deep multi-modal framework that effectively utilizes facial and verbal cues for an automated depression assessment. Specifically, we first partition the audio and video data into fixed-length segments. Then, these segments are fed into the Spatio-Temporal Networks as input, which captures both spatial and temporal features as well as assigns higher weights to the features that contribute most. In addition, Volume Local Directional Structural Pattern (VLDSP) based dynamic feature descriptor is introduced to extract the facial dynamics by encoding the structural aspects. Afterwards, we employ the Temporal Attentive Pooling (TAP) approach to summarize the segment-level features for audio and video data. Finally, the multi-modal factorized bilinear pooling (MFB) strategy is applied to fuse the multi-modal features effectively. An extensive experimental study reveals that the proposed method outperforms state-of-the-art approaches.



AI and Data Science

October 26-27, 2022, Dubai, UAE

Biography

Md Azher Uddin received his B.Sc. degree in Computer Science and Engineering from International Islamic University Chittagong, Bangladesh in 2011 and the Masters leading to Ph.D. degree in Computer Science and Engineering from Kyung Hee University, South Korea, in August 2020. He is currently working as an Assistant Professor with the Department of Computer Science, Heriot-Watt University Dubai, United Arab Emirates. His research interests include Image Processing, Computer Vision, Machine Learning, Big Data analytics and Health-Care Data Analytics.

