Review On Emotion-Based Speech Analysis for Disaster Response and Crisis Management

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Introduction: In an environment of rapid technological advancement, understanding and analyzing human emotions in emergency situations has become an important pursuit in many fields. This review is designed to provide a comprehensive research and report on various aspects of emotional intelligence in stress, including emotional intelligence (SER), social emotional analysis energy during natural disasters [5] [1], and the concept of signal communication in crises. detection [4]] and sentiment analysis on platforms such as Twitter during critical events [1]. Speech Emotion Recognition (SER) and emergencies. In human-computer interaction (HCI), speech recognition plays an important role in this breakthrough. Thoughts expressed in words are especially important in emergency situations [7]. Its applications include call centers, healthcare and digital marketing. However, improving the accuracy of natural language emotion recognition is still a challenge. Research is constantly working towards the creation of systems that can overcome language barriers, recognize different views of the speaker, and work well in noisy environments [2]. The role of social media in disaster response. The emergence of social media platforms has revolutionized the dissemination of messages and information. Expression of emotions, especially during natural disasters [8]. This chapter highlights the importance of public opinion surveys in assessing public opinion, influencing the way public opinion is influenced, and influencing emergency decision-making, providing a good insight into disaster management [6]. Voice Analysis Research in CrisisIt is important to understand the emotions sent by voice signals in crisis situations. Traditional methods use multitasking to identify emotions in the mind to help solve communication problems when sending voice data across the network in critical situations [4]. Sentiment analysis and discovery on Twitter. Twitter's immediacy makes it useful during important events, providing a quick understanding of public opinion and sentiment[1]. This chapter explores the integration of event detection and sentiment analysis using Twitter profiles, using the Las Vegas shooting study as an example [1]. This comprehensive review integrates and presents a wide range of research theories in crisis situations and suggests that competition among leaders and misunderstandings of the response process are important for solving future problems in crisis management.

Literature Review: In [1], the authors Sung-Woo Byun and Seok-Pil Lee constructed a Korean emotional speech database for speech emotion analysis. In [2],

the authors proposed an approach based on emotional perception, which designs an implicit emotional attribute classification. The authors of [3] used two unidirectional LSTM layers for text recognition and fully connected layers are used for acoustic emotion recognition, which are then merged to produce the predicted emotion categories. The authors of [4] used a technique in their project, where it classifies emotions into five different categories. Different approaches for developing speech recognition, which are language and speaker independent, are briefly discussed by the author of [5].

Ideas:

Some of the ideas that we have thought about in this review paper includes:
- **Emotion recognition**
- **Psychological Impact Assessment in Crisis Situations**
- **Speech-based Early Warning System**
- **Cultural and Linguistic Considerations**
- **Integration with Existing Crisis Management Protocol**

Potential Challenges:

While carrying out the research, we came across certain challenges. One of the challenges was with data availability and collection, since the data we will be working with are categorical data. Another challenge we faced is the evaluation of complex emotions and contextual understanding of those emotions. The accuracy and reliability of analysis also posed some drawbacks. Finally, the real-time processing and deployment of the proposed systems came as a big downside in the research.

Conclusion:

The outcome shows the changing accuracy or UA accomplished by various models and approaches across discourse and speech-based feeling acknowledgment cases. IMEMD-CRNN eminently exhibited predominant execution, arriving at 100 percent precision on the TESS dataset. Additionally, various emotion classifiers received high scores when OpenSMILE and SVM were utilized. Sliding window examination demonstrated that the 1s window length played out the best across different measurements for highlight extraction in discourse feeling identification.

In assessing different philosophies for Discourse Feeling Acknowledgement (SER) in emergency situations, various methodologies have shown promising exactnesses in catching feelings from discourse and text information. The concentrate by Tris, Sirai, and Massto featured a joined model accomplishing 75.49% exactness, using both discourse based BLSTM and text-based LSTM organizations. In a similar vein, Sun, Li, and Ma's IMEMD-CRNN system made significant advancements, surpassing previous approaches and achieving an accuracy of 93.54 percent on Emo-DB. Additionally,

emotion recognition studies using emotionally significant regions revealed an improvement of 11% in emotion recognition over entire statements.

Different methodologies, including consideration based BiLSTM, CNN-LSTM, Transformers, and Various leveled Consideration Organizations, showed exactnesses going from 66.09% to 79.5%, stressing the requirement for multimodal combination to improve feeling acknowledgment during emergencies.