MULTIMODAL CYBERBULLYING DETECTION IN VIDEOS

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Introduction:

In an era dominated by digital communication and online interactions, the rise of cyberbullying has become a pressing concern, necessitating innovative approaches for its detection and prevention. This project focuses on the development of a multimodal cyberbullying detection system specifically tailored for videos. Multimodal analysis involves the integration of various data modalities, such as text, audio, and visual cues, to enhance the accuracy and robustness of the detection process. As videos have emerged as a prominent medium for online communication, they present a unique challenge in identifying instances of cyberbullying. Traditional text-based detection
methods may overlook nuanced visual and auditory cues embedded in video content. This project aims to bridge this gap by leveraging advanced machine learning and computer vision techniques to analyse and interpret multimodal data. The system will employ natural language processing algorithms to scrutinize textual content within videos, speech analysis for detecting harmful verbal expressions, and visual recognition technologies to identify non-verbal cues indicative of cyberbullying behaviours. The integration of these modalities will create a comprehensive and effective cyberbullying detection tool capable of providing a holistic assessment of video content.

Objectives:

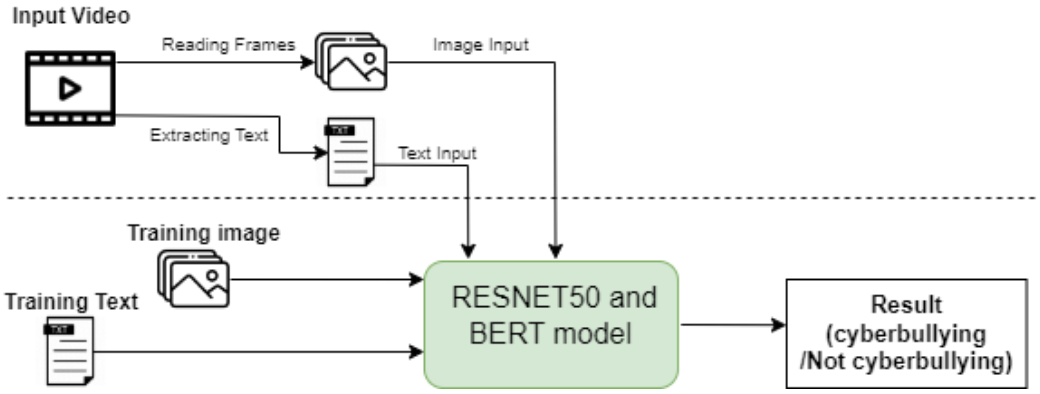
To build a comprehensive cyberbullying detection system capable of identifying cyberbullying across text, videos, and audio.

Improve accuracy and precision in cyberbullying detection compared to existing methods

Methodology:

First, in data collection and preprocessing, we gather and clean up the information our models need to learn from, like pictures or text. This step is crucial because it ensures our data is accurate and ready for training. Next, we move on to training our models. We use a ResNet50 model for

tasks like image recognition, teaching it to recognize objects in images. For tasks involving understanding text, we use a BERT model, which learns to grasp the meaning of words and sentences. Once trained, we evaluate how well our models perform to ensure they're accurate and reliable. Finally, when we're satisfied with their performance, we deploy them for use in real-world applications, where they can assist with tasks like image analysis or understanding text-based queries.



Results and Conclusions:

Our multimodal cyberbullying detection system, integrating natural language processing, machine learning, and computer vision, exhibited promising results in effectively identifying and addressing online abuse within videos.

The system's use of speech analysis successfully identified harmful verbal expressions, while visual recognition technologies, particularly the integration of BERT for text classification and ResNet50 for image classification, played a crucial role in detecting both verbal and non-verbal cues associated with cyberbullying behaviours. This multimodal strategy ensures a comprehensive and accurate assessment of cyberbullying within videos, offering a proactive response to the dynamic nature of online abuse. These findings underscore the potential impact of our approach in fostering a safer digital environment by effectively mitigating cyberbullying instances.

Scope for Future Work:

- Develop real time detection methods for swift intervention and prevention.
- Enhance system's ability to detect cyberbullying across diverse languages and cultural contexts.
- Implement continuous model training mechanisms to keep detection system updated with evolving cyberbullying trends.