

# Emotion Analysis and Video Search: NTU's AI Research Reshaping Media

Alita Sharon February 20, 2024



Artificial intelligence (AI) has become an indispensable tool in transforming the landscape of media and communication. With its ability to analyse vast amounts of data, identify patterns, and predict outcomes, AI is revolutionising how we consume and interact with information. Researchers at Nanyang Technological University (NTU) have been at the forefront of **pioneering advancements in AI**, pushing the boundaries of what is possible in media analysis and content creation.

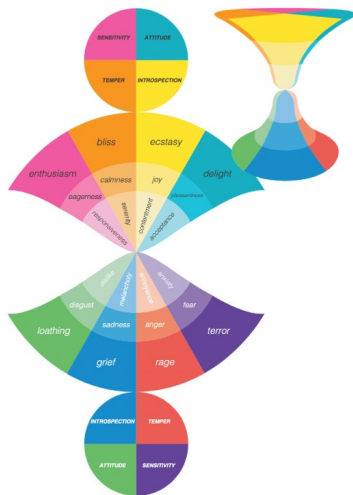


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One of the significant breakthroughs in AI research at NTU comes from the School of Computer Science and Engineering (SCSE), where scientists have developed sophisticated algorithms capable of analysing emotions in text with remarkable accuracy. Led by Prof. Erik Cambria, the team's innovative platform, known as SenticNet, integrates human learning modes with traditional machine learning approaches, enabling it to decipher emotional tones in written words effectively.

Traditional sentiment analysis models often operate as opaque "black boxes," providing little insight into their internal reasoning process. However, SenticNet's logical framework offers transparent insights, ensuring reproducibility and reliability of results. By combining commonsense reasoning with machine learning, SenticNet has demonstrated superior performance, outperforming other sentiment analysis models in recent tests.

The implications of SenticNet's capabilities are profound, particularly in the realm of media monitoring and content moderation. With the sheer volume of social media posts and information available online, AI's ability to decode emotions from text could be a game-changer, enabling more effective sentiment analysis and the identification of malicious content.

In addition to text analysis, AI is also revolutionising the way we interact with video content. Assoc Prof. Sun Aixin and his team at SCSE have developed an innovative method to make video content searchable by matching keywords with on-screen images. Traditional computer vision techniques often struggle with searching long videos efficiently. However, the team's algorithm treats videos as text passages, allowing users to search for specific moments within lengthy clips.

This novel approach enables the seamless segmentation of long videos into shorter clips, enhancing searchability and user experience. Assoc Prof. Sun envisions a wide range of applications for this technology, from educational videos to

surveillance footage, where efficient content search is crucial.

Despite the transformative potential of AI, it also presents new challenges, particularly in the realm of authenticity verification. As technology advances, so too do the capabilities of those seeking to deceive audiences with fake images and videos. Addressing this issue, Assistant Professor Liu Ziwei and his team at SCSE have developed Seq-DeepFake, an advanced algorithm capable of detecting digital fingerprints left by facial manipulation in images.

Seq-DeepFake goes beyond conventional methods by identifying alterations sequentially, enabling rapid detection of manipulated content. Moreover, the algorithm can reverse the manipulation sequence, restoring the original image and empowering users to verify the authenticity of visual information effectively.

As AI continues to evolve, NTU researchers remain committed to pushing the boundaries of innovation and leveraging technology to address the complex challenges facing the media industry. Through their groundbreaking advancements in emotion analysis, video searchability, and authenticity verification, they are shaping the future of media and communication, paving the way for a more informed, transparent, and trustworthy digital landscape.

NTU stands at the forefront of pioneering cutting-edge technology innovations, exemplified by its breakthroughs in ultrathin, stretchable electronics. Spearheaded by Professor Chen Xiaodong, NTU's pioneering research in the field marks a significant step forward in technology innovation, with far-reaching implications across industries such as healthcare and agriculture, bolstering Singapore's position as a global leader in science and technology.

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