Chapter 15
Deep Learning Methods for Modelling Emotional Intelligence

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ABSTRACT

Machine learning and deep learning play a vital role in making smart decisions, especially with huge amounts of data. Identifying the emotional intelligence levels of individuals helps them to avoid superfluous problems in the workplace or in society. Emotions reflect the psychological state of a person or represent a quick (a few minutes or seconds) reactions to a stimulus. Emotions can be categorized on the basis of a person's feelings in a situation: positive, negative, and neutral. Emotional intelligence seeks attention from computer engineers and psychologists to work together to address EI. However, identifying human emotions through deep learning methods is still a challenging task in computer vision. This chapter investigates deep learning models for the recognition and assessment of emotional states with diverse emotional data such as speech and video streaming. Finally, the conclusion summarises the usefulness of DL methods in assessing human emotions. It helps future researchers carry out their work in the field of deep learning-based emotional artificial intelligence.

INTRODUCTION

The term Emotional Intelligence (EI) is referred to as the capability to distinguish emotions, to recognize

Figure 1. Components of Emotional intelligence
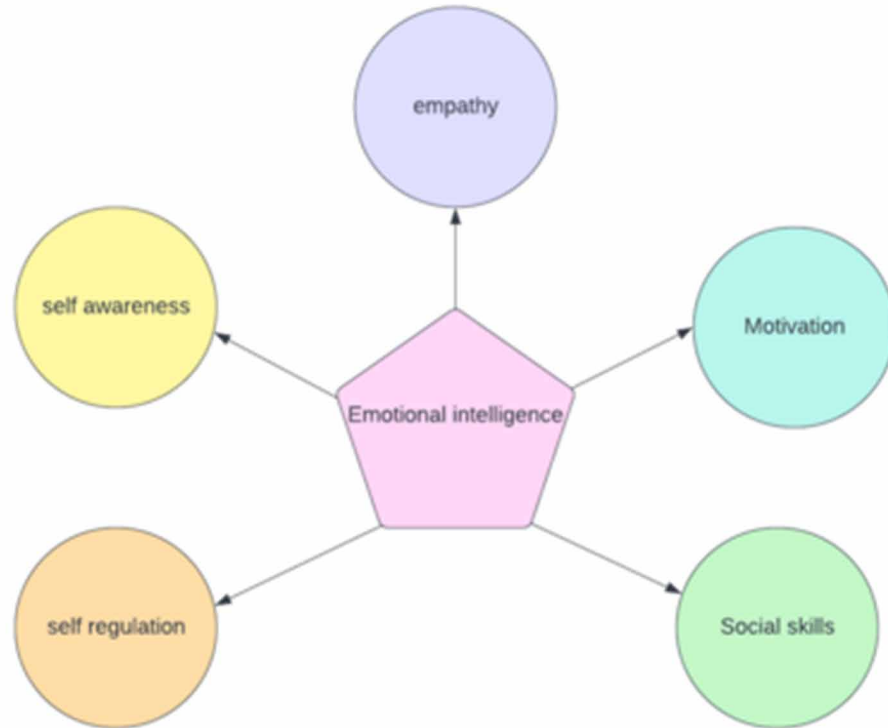
the context of emotion and its associations with the behaviour and expression of the person. Determining the cause of emotions, and interpreting the problem can be solved on basis of the determining emotions. EI considers perceiving the observation of emotion, relating emotion-associated thoughts, interpreting, deriving the motive behind emotions, and regulating emotions (Dollmat & Abdullah, 2021).

Emotional intelligence is defined as "the capacity to reason about emotions, and of emotions to enhance thinking. It includes the abilities to accurately perceive emotions, to access and generate emotions to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions to promote emotional and intellectual growth" (Mayer et al. 2004). Emotions are important because humans can communicate with people (Ekman et al., 2002). Facial expressions are crucial in identifying an individual's emotions. These expression talks a lot about an individual as it possesses diversities. Extracting the information from the facial expressions is not an easy task. Automated recognition of facial emotions using different sensor devices is very much required in various applications. Therefore, it is necessary to develop a system using artificial intelligence techniques which will capture human emotions and facial expressions effectively. Hence, it is an open challenge among the research community. Emotions can also be recognized using the voice of an individual using a device (Schuller et al. 2003). Deep learning-based train models can detect the voice of the person and predict the feeling of a person and his mental state.

Emotional programming is a field where engineers collect data related to different facial expressions, speech, and videos and identify and interpret the emotions of an individual in different situations. Further,

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