CO3519 Assignment – Facial Emotion Recognition Model using Machine Learning

Author : James Birkenhead | G20983016

## ***Introduction***

Theory of Mind Artificial Intelligence (AI) encompasses the enablement of AI systems to understand human emotions. A Theory of Mind AI would have the capability to interpret human needs, emotions and behaviours and respond appropriately.

Whether current AI technologies such as Large Language Models (LLMs) have achieved Theory of Mind is contested, however a potentially powerful application of current AI is for Facial Expression Recognition (FER).

The detection of emotions is typically based on the analysis of facial landmark positions such as nose, eyebrows, mouth etc. and changes to those positions can be analysed. These can then be classified to various emotions (European Data Protection Supervisor, 2021).

FER is deemed to be important since much communication is non-verbal, with some studies suggesting up to 60-80%. FER has numerous applications from areas such as education, neuroscience and psychology, to autopilot and more (Huang et al., 2023).

This paper will explore the implementation of a Machine Leaning (ML) algorithm to recognise and classify basic facial emotions, demonstrating the power of AI in this area.

## ***State Of The Literature***

## ***Datasets***

## ***Model Development***

## ***Model Evaluation***

## ***Demonstration***

## ***Conclusion***

## ***References***

European Data Protection Supervisor (2021). *Facial Emotion Recognition*. [online] Available at: https://www.edps.europa.eu/system/files/2021-05/21-05-26\_techdispatch-facial-emotion-recognition\_ref\_en.pdf.

Huang, Z.-Y., Chiang, C.-C., Chen, J.-H., Chen, Y.-C., Chung, H.-L., Cai, Y.-P. and Hsu, H.-C. (2023). A study on computer vision for facial emotion recognition. *Nature : Scientific Reports*, 13(1). doi:https://doi.org/10.1038/s41598-023-35446-4.