COMP39/9900 Computer Science/IT Capstone Project
School of Computer Science and Engineering, UNSW

Project Number: P7

Project Title: Emotion Recognition Software

Project Clients: Gelareh Mohammadi

Project Specializations: Software development; Artificial Intelligence (Machine/Deep Learning, NLP); Human Computer Interaction (HCI); Computer vision.

Number of groups: 2

Background:

My research is on emotion recognition from multimodal data: face, audio, and physiology. Therefore, my team develops algorithms that can already do this task if the data from all such sensors are available. However, I would like to develop software that can collect all that data in a synchronised way during an interaction and utilise the developed algorithms to make online predictions about the user's emotions. If the scope is too broad for the course, I am open to reducing the scope and gradually add to the system over several terms.

Requirements and Scope:

Developing a desktop or web-based software to collect data from a camera, microphone and smartwatch and detect emotions for a pre-defined scenario (e.g. watching emotional videos) using an algorithm from my group or an off-the-shelf emotion recognition algorithm.

Hardware Requirements: (which I will provide)
Camera: The software needs to be compatible with webcams or other types of cameras capable of capturing facial expressions.
Microphone: Support for microphones to capture audio data.
Smartwatch or some physiology sensors: Compatibility with smartwatches capable of collecting physiological data related to emotions, such as heart rate variability (HRV).

Software Platform:
Desktop or Web-based: At this stage, I prefer to go with a desktop

Data Collection:
Integration with camera, microphone, and smartwatch APIs: Develop modules to capture data streams from these devices.
Data synchronization: Ensure synchronized collection of data from different sources (camera, microphone, smartwatch) for accurate analysis.

Emotion Recognition Algorithm: (this will be provided or off-the-shelf algorithms can be used) considering the requirements of the deployed algorithm in data processing

User Interface:
Intuitive Design: Develop a user-friendly interface for data input, visualization of collected data, and presentation of emotion detection results.
Compatibility: Ensure compatibility with the screen size

Testing and Validation:

Functional Testing: Conduct thorough testing to ensure the proper functionality of all features, including data collection, synchronisation, processing, emotion recognition, and user interface interactions.
Performance Testing: Evaluate the software's performance in terms of speed, accuracy, and resource utilization.
User Feedback: Gather feedback from users to identify areas for improvement and refinement.

Documentation and Support:
User Manual: Prepare comprehensive documentation to guide users on how to use the software effectively.

Deployment and Distribution:

Compatibility: Ensure compatibility with Windows OS

Required Knowledge and skills:

- Software Engineering

- Knowledge of HCI principles and user experience (UX) design concepts to develop an intuitive and user-friendly interface for the software.

- Understanding of usability testing methodologies and techniques to gather feedback and iteratively improve the user interface design.

- Familiarity with hardware APIs and SDKs for integrating data collection from cameras, microphones, and smartwatches into the software.

- some familiarity with machine learning and data analysis

Expected outcomes/deliverables:

A software and the relevant documentation

Supervision:

Gelareh Mohammadi

Additional resources:

TBA