**Current Situation:**

Microsoft has developed a set of API’s, known as Cognitive Services, that undertake a variety of functionality in areas of computer vision, speech, language, knowledge, and search. Of particular interest is the Emotion API, which can distinguish various emotions on multiple faces on a picture or video. For pictures, the API returns a JSON object containing the position of the face and a list of emotions and their corresponding probabilities of applying to that face. For videos, the API does the same but also tracks these measurements over time.

Current web and app content is designed to engage users, i.e. evoke emotional responses. Currently used metrics of such emotional engagement are centered around clicks, time spent on a piece of content, questionnaires, etc. Although useful, such metrics can often lack insight on their own.

**Problem Statement:**

In this project, we aim to add an element of emotion recognition to develop a highly accurate recommendation and feedback engine. The business case comes from a need to assess users’ engagement levels. For instance, in an educational platform, there is a need for the content-provider to gauge the engagement of the students in order to improve the course material. Similarly, in an online shopping context, adding an element of emotion can enhance a platform’s recommendation engine, thus providing more relevant items to the user and creating a deeper emotional experience.

Essentially, the project aims to integrate the Emotions API inside a platform to provide accurate emotional engagement metrics to the content-provider in response to different material available on the web/app, as well as provide real-time recommendations to the user based on a combination of emotional responses and the traditional metrics of engagement.

**Proposed Solution:**

We propose the creation of a shopping webapp (the exact items sold will be decided after an initial acceptance of the proposal), which will employ traditional metrics of engagement (including clicks, time spent, and certain actions) in combination with the emotional responses from the user obtained by taking pictures of the user and feeding them to the API. The platform will be able to catalogue users’ responses to various content and report these along with other user activity back to the content-provider. Our platform will also be able to make real-time product recommendations to specific users.

**Technology:**

The platform will make use of the Emotions API to obtain preliminary emotional responses. Furthermore, we will apply a second level of machine learning to deduce the levels of engagement from the emotional responses, using open-source libraries. In terms of the recommendation engine, we will either employ the Microsoft Recommendations API, which is also part of Cognitive Services, or we will create a recommendation engine from scratch, again using open-source libraries, to have greater flexibility in using the input features that we require.

The basic break-up of the project can be seen overleaf. The webapp will consist of a front-end, serving as the data collector and displayer, and a back-end which will handle all the data processing. Specifically, the front-end will display the products available for purchase, along with the action buttons (such as “add to cart”, “checkout”, etc.) and will display the recommendations generated by the engine. The back-end will consist of a server and the recommendation engine, which will be hosted on Azure. The server will be in charge of communicating with the Emotions API and feeding the results to the recommendation engine, either to train it or to make an actual recommendation. Interfacing between the different modules will be through JSON or CSV files (for the recommendation engine).

