

Recognizing emotions with technology and starting discussions

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Randall Theuns
Amsterdam University of Applied
Sciences
Software Engineering
Amsterdam, The Netherlands
randall.theuns@hva.nl

Max Beije
Amsterdam University of Applied
Sciences
Business IT & Management
Amsterdam, The Netherlands
max.beije@hva.nl

Frank Portengen
Amsterdam University of Applied
Sciences
Business IT & Management
Amsterdam, The Netherlands
frank.portengen@hva.nl

ABSTRACT

According to Waag Society and the Research Group Crossmedia, recent studies have shown that young adults are hard to reach when it comes down to (cultural) heritage. Waag Society is researching how cultural heritage institutions can connect to these groups and how heritage objects can be relevant to (young) people. Both parties believe that a better understanding of the emotions people have, is very important to learn more about the way people value cultural heritage. Therefore, Waag Society and the Research Group Crossmedia asked students of the HvA to design an interactive tool that captures young adults emotions and enables them to discuss these emotions with their peers when looking at (cultural) heritage.

1. KEYWORDS

Facial recognition, prototype, emotions, heritage, discussion, expressions

2. INTRODUCTION

During the minor 'Research in Emerging Technologies', we've chosen the project 'Emotions in Heritage' that is commissioned by the Research Group Crossmedia (HvA) and the Waag Society. The Waag Society explores emerging technologies not only related to the internet, but also related to biotechnology and cognitive sciences. Art and culture often plays a central role in our research as well.

Our project involves systematically collecting the different emotions people experience when they perceive (cultural) heritage, and use this information to spark meaningful conversations between different parties by visualizing the different emotions. Cultural heritage could, for example, mean a painting, a building, or even a tradition. Earlier research regarding emotion recognition has already been conducted. However, these researches were mostly conducted from a psychological point of view; what emotions are being expressed and why do young adults express a specific emotion? As such, models to define the emotions already exist. Currently, there is a lack of instrumentation to capture these emotions and allow young adults to openly discuss their emotions regarding heritage.

There are many options available to recognize emotions. For example, facial expression recognition, voice recognition, text recognition, and wireless signals. Initially, we did research regarding these different methods. We found a paper [1] which contained the various recognition methods and also included

the accuracy with which they were able to recognize emotions. Using these measurements, we made the choice to limit how our project will recognize emotions to the method with the highest accuracy. The result of this research concluded that facial expression recognition had the highest accuracy at an average of 94.48%

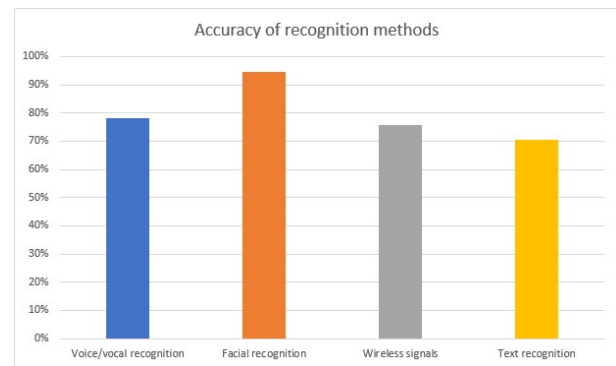


Figure 1: Accuracy of recognition methods

Besides accuracy, two more restraints are defined:

- (1) If at all possible, all code and libraries used must be open source.
- (2) The prototype has to display the predicted emotions in an interactive way.

Due to these requirements, and our choice to use facial expression recognition, the main research question of this paper is: *Does the visualization of emotions of young people (aged 16-26) by facial expression recognition software, lead to discussion regarding the displayed content?*

By working towards answering this question, we are developing a prototype that collects the relevant information that is required for the goal of the project: starting a meaningful conversation between young adults, regarding a specific subject. Furthermore, if the prototype proves to be useful and provides valid data, it might be used in subsequent research as a tool for collecting data.

3. RELATED WORK

Our project, as defined by the Waag Society, is already based on two previous research projects. The first project explores a method to sympathize with other people's emotions around

heritage objects. Young people, teachers, and heritage professionals each map their emotions around a certain heritage topic and use that mapping as a starting point for discussion [2]. The goal of this research is very similar to our own, however the means to reach that goal differ, in that our research aims to use technology to read the emotions of the participants, as opposed to mapping them themselves.

The second project examines how participation, narratives, digital media, and atmosphere affect museum visitors when visiting an exhibition and how exhibition makers can influence these visitor experiences. One of the research questions is how people are emotionally affected when encountering one of these means []. Just like the first project, our research differs due to our focus on the technological aspect of detecting emotions.

Besides the above two project which were already defined at the start of the project, we've also found research conducted towards facial expression recognition [1]. This research focuses solely on detecting emotions using a camera. We also had the opportunity to try out the software created during this research. Unlike this research, our research also seeks to visualize these predicted emotions in a meaningful way in order to spark a discussion.

Lastly, we found a series of articles that aim to create open source facial expression recognition software [3]. All of the chosen libraries and datasets were open source or easily available. We have chosen these articles as the basis for our own prototype.

4. METHODS

To be added

5. RESULTS

To be added

6. DISCUSSION

To be added

7. ACKNOWLEDGMENT

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