Sensor based sentiment analysis

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Abstract

Previous approaches for sentiment analysis have mainly focused on textual data to identify and extract subjective information and emotions explicitly expressed in text. This type of analysis is limited to opinion mining that does not use to predict the wide range of feelings experienced by humans. This is due to the lack of sentiment detection. In this work, we propose an approach for sensor based sentiment analysis that allows us to extract feelings and detection of sentiment over real-time data.

1. Introduction

Sentiment analysis offers a promising way for modeling textual content available in real-time stream[1].Sentiment analysis research is mostly concerned with the study of static data. But sensors embedded in wearable devices are valuable source of information for real-time sentiment analytics, allowing us to integrate data feeds coming from both the online and the offline world [2].

2. Problem Statement

Sentiment can be defined as an attitude, opinion or feeling towards something, such as a person, organization, product or location. Textual sentiment analysis is limited to analyzing emotions that are explicitly expressed in textual content, but this source of information is often insufficient to capture the actual feelings of a person and their intensity. Consider a scenario where a person watches a movie on Netflix, their review/comments or the rating paradigm are not sufficient by themselves to justify what that person felt while watching the movie.

3. Related Work

Cloudbrain is open-source platform for wearable data analytics. It allows user to send/store data through wearable device(like apple watch) and visualize live or recorded data.[3] Exmocare bt2 had produced wearable device for emotion detection based on heart rate, location, body temperature and skin moisture levels.

4. Research Question

The existing research does focus on emotions explicitly expressed in text; it doesn't include the feelings experienced by human. So the main interest of our research is two-folded. First, is to gather relevant and sufficient data from sensors to perform sentiment analysis. Second, is to make system understand and classify the emotions in real-time using the first one, in addition to the textual data and uses the outcome in providing better and more personalized service.

Assumption is that by applying the unsupervised learning methods on sensor based data, we can design effective algorithm for automated categorization of sentiments along with its intensity.

5. Proposed Solution

We propose a sentiment analysis approach that will measure not just opinion but also the actual mood, sentiments and feelings based on parameters such as heart rate, location, body temperature, skin moisture levels, sleep cycles, footsteps and / or brainwaves. We expect to gather data from sensors installed in ubiquitous devices and Perform unsupervised learning on data to build a classification model for understanding and classifying emotions in real-time.

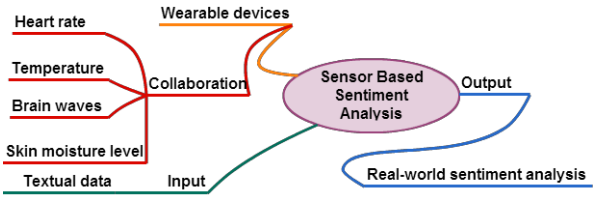

Figure 1: Mindmap diagram of proposed solution

6. Future Work

In order to capture real-time sentiment analysis, our first step would be to develop an application that integrates the sentiment analysis data and the data gathered from wearable technology parameters.

7. References

[1] Huifeng Tang, Songbo Tan and Xueqi Cheng, " A survey on sentiment detection of reviews", In Proceedings of the Expert Systems with Applications 36, Elsevier Ltd., Beijing, 2009

[2] Bermingham, Adam and Smeaton, Alan F. (2010) Crowdsourced real-world sensing: sentiment analysis and the real-time web. In: AICS 2010 - sentiment analysis Workshop at Artificial Intelligence and Cognitive Science, 30 August - 1 September 2010, Galway, Ireland.

[3] N. Kaji and M. Kitsuregawa, "Building lexicon for sentiment analysis from massive collection of HTML documents," in Proceedings of the Joint Conference on Empirical Methods in Natural Language Processing and Computational Natural Language Learning (EMNLP-CoNLL), pp. 1075-1083, 2007

[This Project has been funded by **UNLP,INSIGHT-CENTRE for Data Analytic**]