Emotional and Behavioral Traits Recognition (EBTR) Project

Introduction

Emotional and Behavioral Traits Recognition (EBTR) is to study the trait of individual's emotions and behaviors from the deep machine learning perspective, so as to make the observation coding more intelligent. Observational studies are the profound method in identifying gaps in existing knowledge, by showing behavioral patterns in more details, suggesting new data analysis procedures, or even completely new experiments. Observation studies enable participants to behave in a spontaneous way in a natural context, which largely offsets participants' passive responses in self-reports.

Here I am going to present an Emotional and Behavioral Traits Recognition (EBTR) tool to assist manual observation coding. The main function of this tool is to mining the communication text and retrieval the sentimental expressions from according to the Emotional and Behavioral Coding Menu. Technically, EBTR is a plug-in unit within the video/audio indicating possible code to observers. Conceptually, EBTR archive rich context under guided learning to adapt coding menu, as trained.

Installation of EBTR software

Please install ffmpeg before you go on. Detailed guide click here.

Step 1: FFmpeg package

on OSX

brew install ffmpeg

on Ubuntu

sudo apt install ffmpeg

on Windows download ffmpeg windows build:

https://ffmpeg.zeranoe.com/builds/ and extract it.

Step 2: Python package

pip install baidu-aip # Baidu AIP service

pip install thulac # THU Lexical Analyzer for Chinese

pip install metapy # Meta analysis for English

pip install jieba #

pip install snowNLP # sentimental analysis pretrained model

Step3: Clone this project to the local machine

Function of EBTR software

During this project, we realized three functions in EBTR:

1. Video transformation into sound;

2. Text content edit;

3. Matching codes, searching for words, and emotion analysis

- Video transformation into sound

  Firstly, the EBTR takes interview video as input and use ffmpeg to extract the sound content in the video file. We install ffmpeg and configure the binary path of ffmpeg in User Interface.

- Text content edit

  Secondly, EBTR transferred the sound data into text content by the use of Kedaxunfei API. Split in minutes, the user interface of EBTR presents the transferred text content.

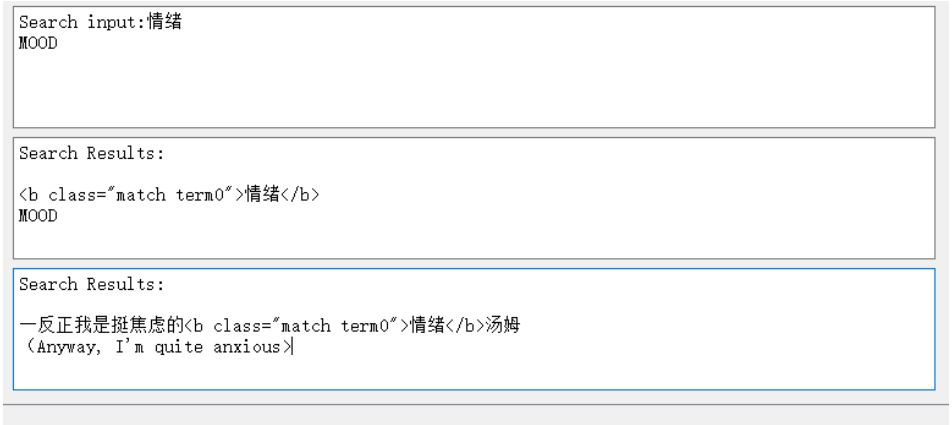
The data is split in minutes. In this case, the test materials are original in Chinese, we have translated the text of Chinese into English for your reference.

The user could edit the text according to their understanding of video material (including but not limited to wrong transformation of text) and taking notes. User's edition track could also be used for further improvement in EBTR and training process.

- Matching codes, searching for words, and emotion analysis

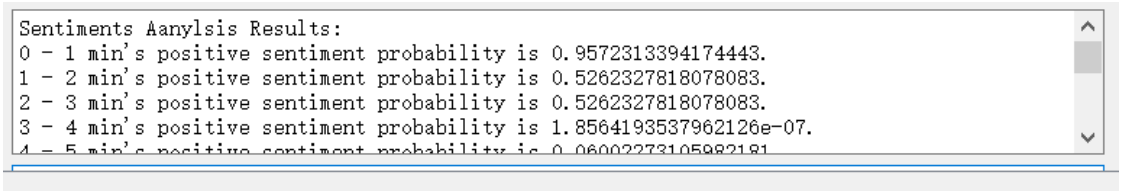
  Match codes: EBTR matches words in the text as codes according to the coding menu of the users. Users can upload their own version of coding menu files in the configure file.

Search words: Users could search for a specific word by using searching words function. EBTR takes user's word as input and find all the words in the text file.



Emotion analysis: EBTR recognize the positive and negative emotion during the conversation by every minutes. We use a pre-trained model for classification due to the relatively limited dataset. By using emotion analysis, user will get a potential motion scores of each minute's conversations. The score ranges from [0,1]. 1 is most positive emotion and 0 represents the least positive emotion.

In this case, emotion analysis uses pre-trained Bayesian model, we can extent emotion analysis by using different other model such as SVM and neural network.



Detail implementation of software

In this part, I will introduce the implementation of software and further development. The main logic of software is in python file {root directory}/psycoding/GUI/main.py.

1. User interface

   I use pyqt library to implement the user interface and create basic operation of files, such as load video, load processed text data and configure the ffmpeg path and wordset path.

2. Match words and Search words function is implemented in function searching words and matching words.
3. Emotional analysis is implemented in function analysis. Further methods for emotional analysis could be added here.

Conclusion

Computer technology has been contributed to all significant advances in psychological research methodology, such as most notably regarding the complexity of coding systems, the recording of observations and codes, and statistical analyses. Recording has never been so convenient, affordable, and ubiquitous, which provide plentiful observation resources and make programming for psychology a field poised for an explosion in opportunities. Naturalistic

observation with a method can enrich psychological science in a profound way, as well as an increase in its availability and impact, so as computerized coding of behavior as EBTR contributed.