Emotion Patterns in Music Playlists

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Second Project meeting

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Introduction

Previously On Sara&Mario Project

In the previous meeting we analyzed the state-of-the-art of Emotion Detection.

Next steps:

- Analyze existent emotion classifiers
- Statistics and details about MoodyLyrics
- Natural language processors (nlptoolkit, scipy, spaCy) and embedders (word2vect, fasttext)
- Start workin!

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Emotion classifiers analysis

The emotion classifiers APIs we analyzed are:

1. IBM Watson NLU
2. IBM Watson Tone Analyzer
3. ParallelDots AI
4. Qemotion

1) IBM Watson: Natural Language Understanding (I)

Watson is a **question answering computer** system capable of answering questions posed in **natural language**, developed by IBM.[Survey 2014]

Cool story

In 2011, the Watson computer system competed on Jeopardy! against legendary champions Brad Rutter and Ken Jennings winning the first place prize of $1 million [Survey 2014]

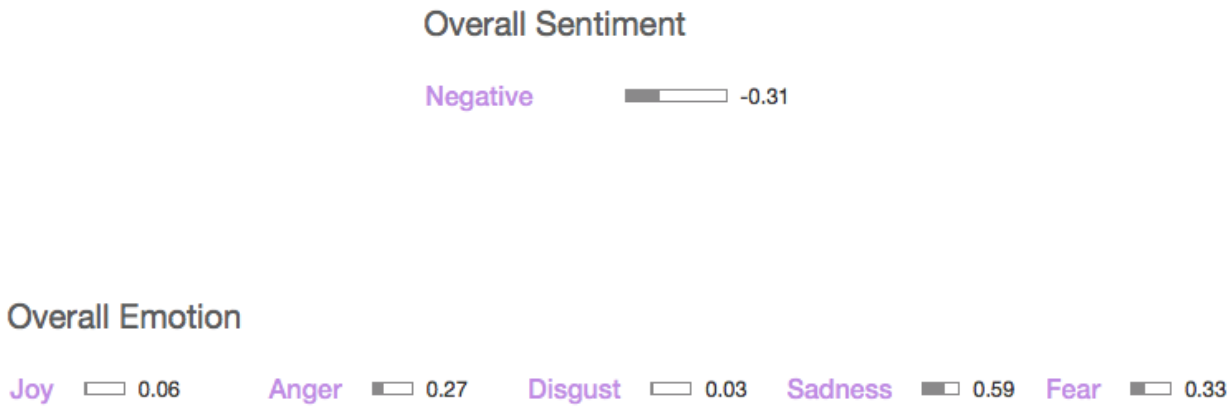
1) IBM Watson: Natural Language Understanding (II)

Natural Language Understanding is a collection of **APIs** that allows to:[Microsoft, 2015]

- Recognize the **overall sentiment**, in a scale from negative to positive [-1,1];
- Detect the **emotion percentage** between: joy, anger, disgust, sadness, fear;
- Determine **keywords** ranked by relevance;
- Extract **entities**: people, companies, organizations, cities and other information;
- Classify content into a **hierarchical categories**;
- Identify **general concepts** that may not be directly referenced in the text;
- Distinguish the **semantic roles** parsing sentences into subject, action and object.

1) IBM Watson NLU: Demo (I)

Results obtained analyzing **Oasis** - **Wonderwall** lyrics (I).



1) IBM Watson NLU: Demo (II)

Results obtained analyzing **Oasis - Wonderwall** lyrics (II).

Concept	Score
2008 singles	0.95
2009 singles	0.91
2005 singles	0.75
Billboard Alternative Songs number-one singles	0.74
Number-one singles in New Zealand	0.74
Journey	0.65
Wonderwall	0.64
English-language films	0.63

Name	Type	Score
Backbeat	Company	0.86

That *Object* they *Subject* 're gonna throw it back to you

2) IBM Watson: Tone Analyzer

It uses linguistic analysis to detect joy, fear, sadness, anger, analytical , confident and tentative tones found in text. [Ed from text]

Possible sources

Tweets, Online Review, Email message, your own text.

It uses both:

- **the document level**: to get a sense of the overall tone
- and the **sentence level**: to identify specific areas of your content where tones are the strongest.

The results obtained with **Oasis - Wonderwall** are identical to the ones obtained from **IBM Watson: NLU**

3) ParallelDots APIs: Demo

Their **Emotion Analysis classifier** is trained on their proprietary dataset and tells whether the underlying emotion behind a message is: **Happy, Sad, Angry, Fearful, Excited, Funny or Sarcastic**.[?]
The result obtained analyzing **Oasis - Wonderwall** lyrics is showed in the following figure.

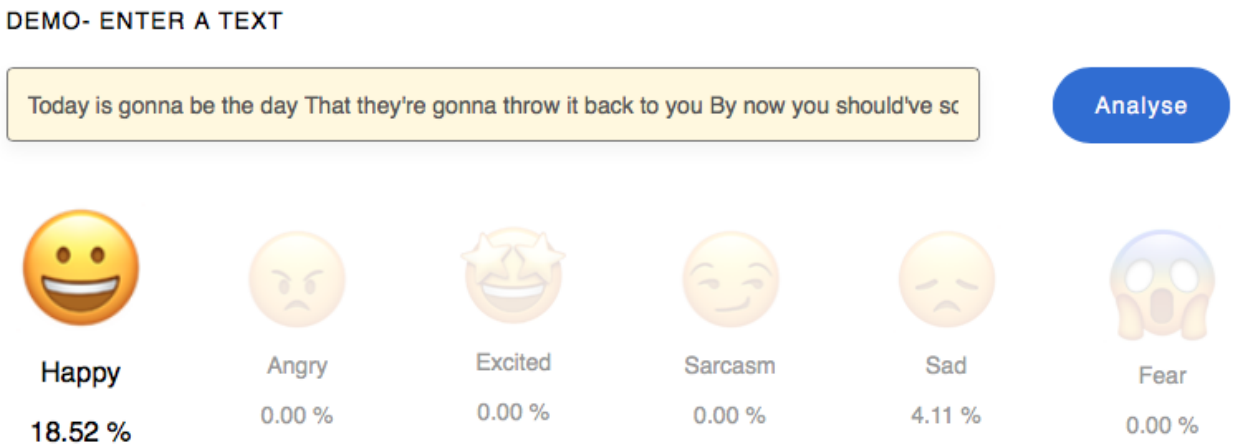


Figure 1: Output for Oasis - Wonderwall

4) Qemotion

Qemotion detects the main emotion of the speech and will define the corresponding emotion in terms of **temperature** (literally temperature) [**?**].

- From 31°C to 40°C → Happiness
- From 21°C to 30°C → Surprise
- From 11°C to 20°C → Calm
- From 6°C to 10°C → Fear
- From -5°C to 5°C → Sadness and Disappointment
- From -14°C to -6°C → Anger
- From -20°C to -15°C → Disgust

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lyrics_downloader.py (1)

We wrote a Python script for downloading lyrics. We used:

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- LyricWikia to download the lyrics

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lyrics_downloader.py (2)

Our script produces in output:

- A folder containing lyrics in files named: *EMOTION_ARTIST_TITLE-OF-SONG*
- A log file in which we keep track of the errors we found

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References

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  link
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  Sentiment Analysis Algorithms and Applications: A Survey.
  Ain Shams Engineering Journal
- Shiv Naresh Shivhare1 and Prof. Saritha Khethawat (2012)
  Emotion Detection From Text