

Twitter corpus about technology for sentiment and emotion analysis with automatic and manual annotation

Building Language Resources

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Description

- 140 monolingual tweets in English
- Topic: Technology
- Sentiment analysis (positive, negative, neutral)
- Emotion detection (joy, sadness, anger, optimism)
- Automatic and manual annotation
- Regular text and adversarial text

Examples

id	text	adversarial_text	sentiment_manual	sentiment_auto	sentiment_auto_adv	emotion_manual	emotion_auto	emotion_auto_adv
1488301060334759939	just put a CD into my MacBook to burn it and my computer is literally trembling with reawakened recognition 😏	just put a compact disk into...	negative	positive (0.532)	positive (0.658)	joy	joy (0.921)	joy (0.725)
1488301057650438144	oh yeah tesla well what about a car that just logs into your tiktok acct and drives you to starbucks	...about a automobile that...	neutral	neutral (0.655)	neutral (0.782)	joy	joy (0.450)	optimism (0.433)
1488301040160043008	#100DaysOfCode Haven't updated in a while due to not feeling well, just been reviewing some HTML/CSS & JavaScript until I feel better to take on new concepts Also been watching mock interviews :)	...been viewing mock interviews :)	negative	neutral (0.500)	positive (0.465)	optimism	sadness (0.691)	sadness (0.536)

Methodology

- 140 tweets about technology
- Exclude retweets, replies, quotes, links to avoid repetitions or spam
- 20 annotations in common for ITA and guidelines
- 40 annotations individually after deciding guidelines
- Compare manual and automatic annotations
- Compare automatic annotations of adversarial examples

Data Statement

Curation Rationale →

Obtain opinions with pronounced sentiments

Language Variety →

English BCP 47 code (en)

Speaker Demographic →

Male (70.4%)

18 - 49 years old (78.7%)

United States

Speech Situation →

Spontaneous; Time sensitive text

Text Characteristics →

Context "Interests and Hobbies: Technology"

License

- The resource and code are publicly available at [GitHub](#).
- Problems with new Twitter policy
- Remove tweet text and only keep ID
- The code is licensed under the MIT open source license.
- Non-code materials provided under terms of the CC BY 4.0 license.

Initial Guidelines

- Select only one label for each task
- Read one tweet and annotate sentiment and emotion
- 3 labels for sentiment (positive, negative, neutral)
- 4 labels for emotion (joy, anger, sadness, optimism)

Inter Annotator Agreement

- 20 annotations in common for ITA
- Calculate agreement and kappa in sentiment and emotions
- Look at individual examples for disagreement
- Update guidelines if necessary
- Repeat annotation with new guidelines
- Recalculate agreement and kappa to see improvement
- Select the majority class for the final corpus

Inter Annotator Agreement

text	sentiment_ julen	sentiment_ oihane	sentiment_ javier	emotion_ julen	emotion_ oihane	emotion_ javier
just put a CD into my MacBook to burn it and my computer is literally trembling with reawakened recognition 😊	negative	positive	negative	anger	joy	joy
oh yeah tesla well what about a car that just logs into your tiktok acct and drives you to starbucks	neutral	positive	negative	joy	joy	anger
#100DaysOfCode Haven't updated in a while due to not feeling well, just been reviewing some HTML/CSS & JavaScript until I feel better to take on new concepts Also been watching mock interviews :)	negative	negative	negative	sadness	optimism	optimism

Inter Annotator Agreement

- Initial agreement and kappa values for each task
- Better than expected with very few guidelines
- Not good enough, update guidelines

	sentiment agreement	sentiment kappa	emotion agreement	emotion kappa
julen - oihane	0.70	0.54	0.55	0.33
julen - javier	0.60	0.40	0.40	0.13
javier - oihane	0.60	0.39	0.65	0.46
average	0.63	0.44	0.53	0.31

Updated Guidelines

- Misunderstanding some words (burn CD)
- Misunderstanding some symbols (<3 = <3) (> = >)
- Look or ask for the meaning

EMOTION		SENTIMENT	
Problem	Solution	Problem	Solution
If not sure / No emotion	Less specific: Joy	Irony / Sarcasm	Sentiment opposed to the overall sentiment. Either “positive” or “negative”
Joy / Optimism	More general: Joy	Contradicting sentiments	Overall sentiment

Adversarial examples

- Create adversarial tweets automatically if possible
- Create adversarial tweets manually if necessary
- Measure the impact in the accuracy of the models
- The aim is to confuse the models
- Keep the manual label, no need to annotate again
- For example, substituting words with their synonyms
- Add these adversarial examples to our final resource

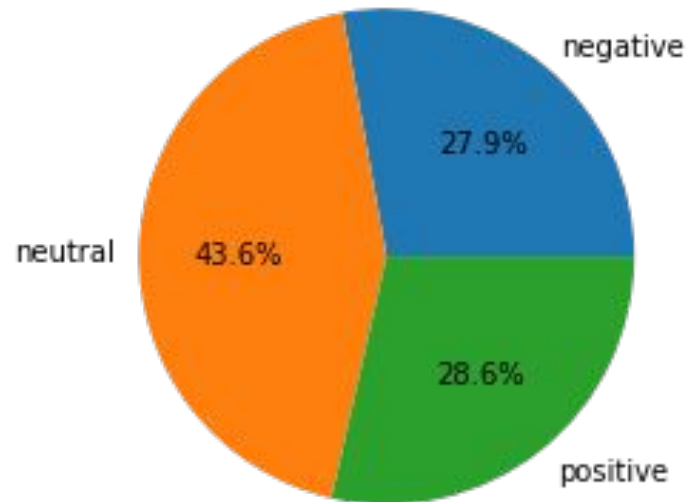
Automatic Analysis

- Automatic sentiment and emotion analysis
- Huggingface Transformers fine tuned for those tasks (TweetEval)
- We select the most probable tag
- Pie charts for tag counts
- Wordclouds for word frequencies
- Comparison with manual annotation
- Comparison with adversarial tweets

Pie charts

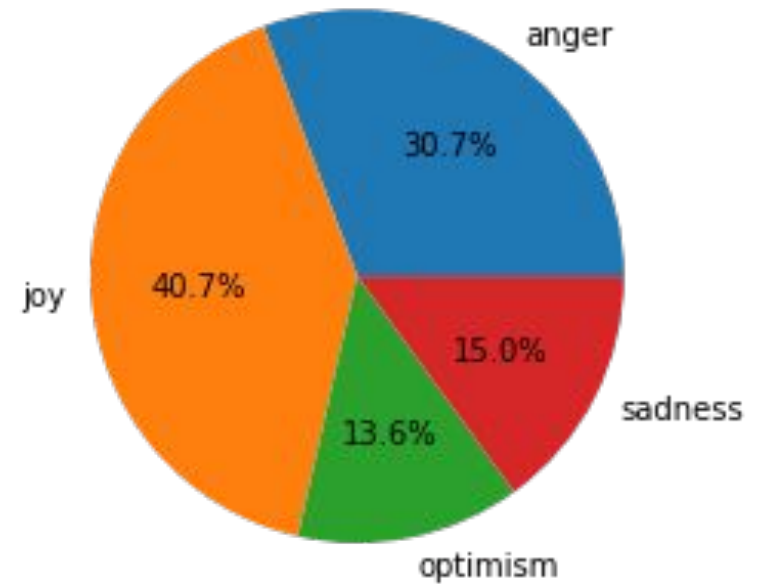
Sentiments

Sentiment percentages for technology tweets



Emotions

Emotion percentages for technology tweets



Sentiment wordclouds (all vs neutral)



Remaining work

- Annotate ITA tweets with new guidelines
- Recalculate ITA measures
- Annotate 40 tweets individually
- Create adversarial tweets
- Compare manual and automatic annotation
- Compare adversarial results
- Pie charts and wordclouds for manual annotation

Conclusions

- Annotation is more difficult than we thought
- Sentiment annotation easier than emotion annotation
- Defining good guidelines is important
- Creating good adversarial examples automatically is difficult
- Visualization is very helpful to identify patterns

Thank you!