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

Building Language Resources

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Dataset slice example

id	text	adversarial_text	sentiment_auto	sentiment_annotator	emotion_auto	emotion_annotator
1488301 0603347 59939	just put a CD into my MacBook to burn it and m...	just put a CD into my MacBook to burn it and m...	positive (0.532)	positive	joy (0.921)	joy
1488301 0576504 38144	oh yeah tesla well what about a car that just ...	oh yeah tesla well what about a automobiles th...	neutral (0.655)	neutral	joy (0.450)	anger
1488301 0401600 43008	#100DaysOfCode Haven’t updated in a while due ...	#100DaysOfCode Haven updated in a while due to...	neutral (0.500)	neutral	sadness (0.691)	joy

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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

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

- 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

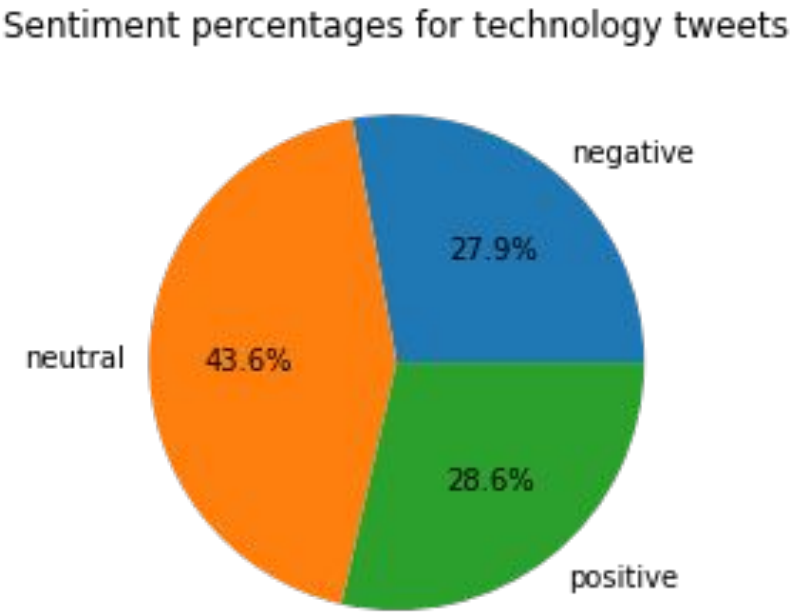
- Create adversarial tweets automatically if possible
- Create adversarial tweets manually if necessary
- Measure the impact in the accuracy of the models
- The aim is to confuse the models
- Keep the manual label, no need to annotate again
- For example, substituting words with their synonyms
- Add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

Automatic Analysis

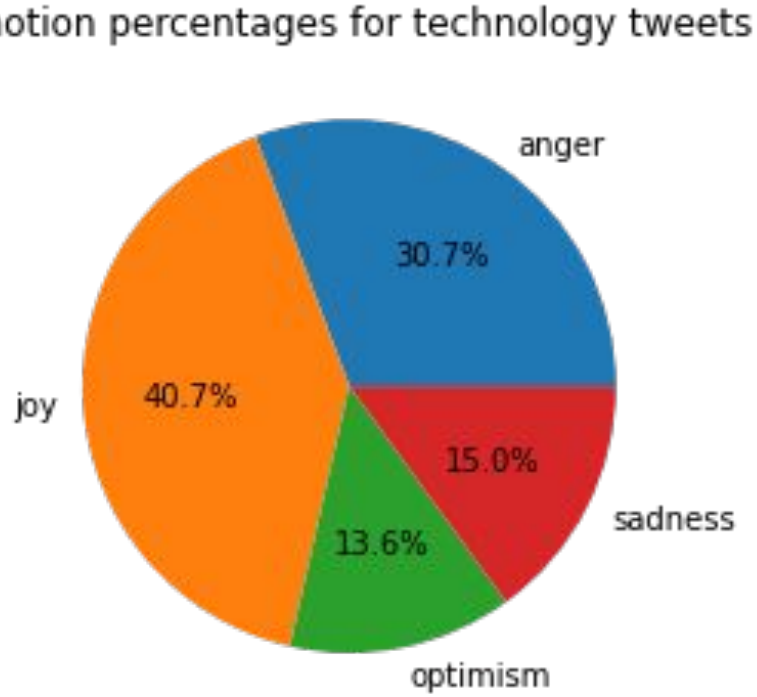
- Automatic sentiment and emotion analysis
- Huggingface Transformers fine tuned for those tasks (TweetEval)
- We select the most probable tag
- Pie charts for tag counts
- Wordclouds for word frequencies
- Comparison with manual annotation
- Comparison with adversarial tweets

Pie charts

Sentiments

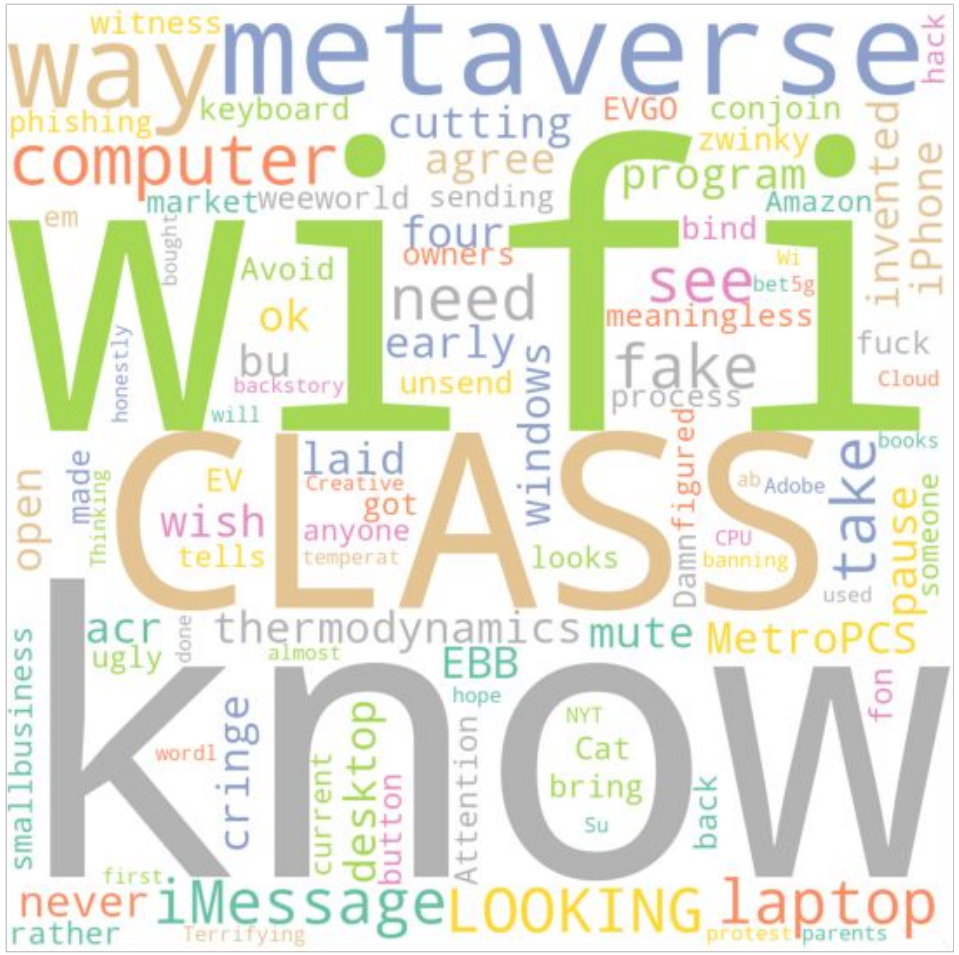


Emotions



Sentiment wordclouds (all vs neutral)

Sentiment wordclouds (negative vs positive)



Emotion wordclouds (anger vs joy)

Emotion wordclouds (sadness vs optimism)

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