Using SentiWordNet for Analyzing Radical Contents on Web Forums

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Background

Who is interested in this topic?

UK government interests in this topic according to, having launched a ‘Prevent Strategy’ to prevent radicalization of youth in Great Britain and blocked networks that support terrorists (Morgan, 2011).

[1] Morgan, G. (2011) 'Government to block terrorist web sites', computing.co.uk, 07 Jun 2011.

Background (2)

- Internet and web forums have become important place for social communication.
- Some radical groups also use them for communication and disseminating their ideologies to the public.
- So I intended to develop techniques to classify and detect radical contents. The final result obtained could be built into a web browser based tool.

Research Question

How effective is SentiWordNet for detecting opinions and emotions on web forums?

Data

- Selected by using research from 21 people (Arabic speaker).
- Two Arabic forums have been selected: Montada and Qawem.

Method (1)

1. Collected data from web forums.
2. Translated sentences to English Language by Arabic speaker.*
3. Built system by using Python programming, SentiWordNet, WordNet and NLTK.
4. Used POS tagging each word in sentences.
5. Removed stopwords from sentences.
6. Separated sentences into words for calculating scored.

*Khaled Nakkachi (Translated sentences from Arabic to English)

Method (2)

7. Calculated scored of each word by adapting formulas from Neivarouskaya, et al. (2007).

$$Pos\_weight = \left[\frac{pos}{senses}\right]$$

$$Neg\_weight = \left[\frac{neg}{senses}\right]$$

pos is the number of lemma that have *Pos(s)(i) >= Neg(s)(i)* and *Pos(s)(i) !=0*
neg is the number of lemma that have *Neg(s)(i) >= Pos(s)(i)* and *Neg(s)(i) !=0*
senses is the total number of lemma in synsets.

Neviarouskaya A, Prendinger H, Ishizuka M (2007) Textual Affect Sensing for Sociable and Expressive Online Communication. Paper presented at the Proceedings of the 2nd international conference on Affective Computing and Intelligent Interaction, Lisbon, Portugal.

Method (3)

8. Calculate sentences' scores from words' scores by using formula from Khan and Baharudin (2011)

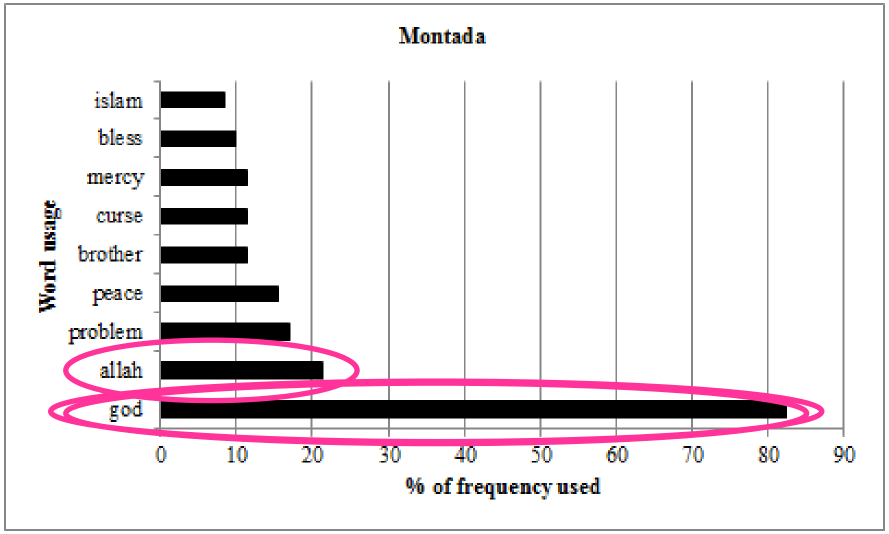
$$Sentence\_score = \left[\frac{\sum_{i=1}^{n} Score(i)}{n}\right]$$

Score(i) is the positive/negative scores of the word in sentences.

n is the number of words in sentences.

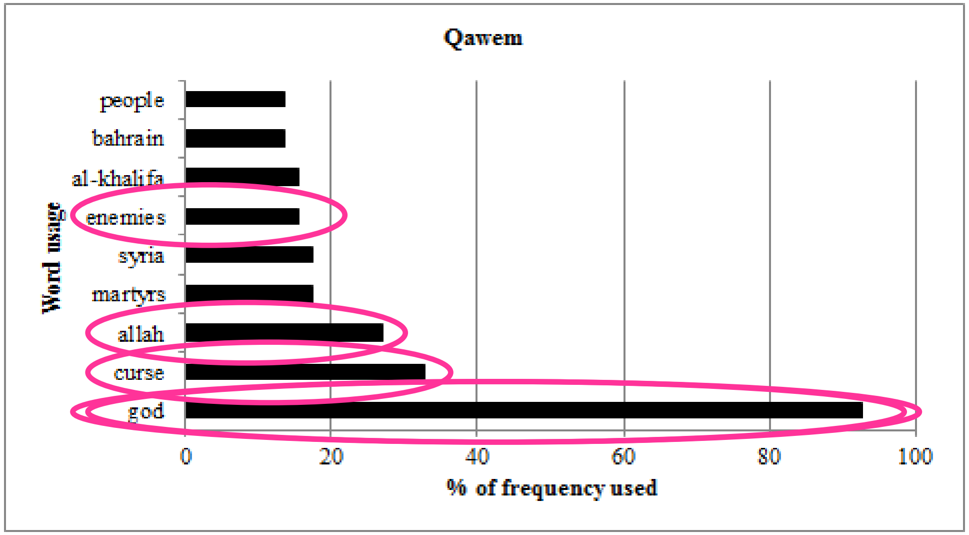
Khan A, Baharudin B (2011) Sentiment classification using sentence-level semantic orientation of opinion terms from blogs. Paper presented at the National Postgraduate Conference (NPC), 2011, 19-20 Sept. 2011.

Results (1)

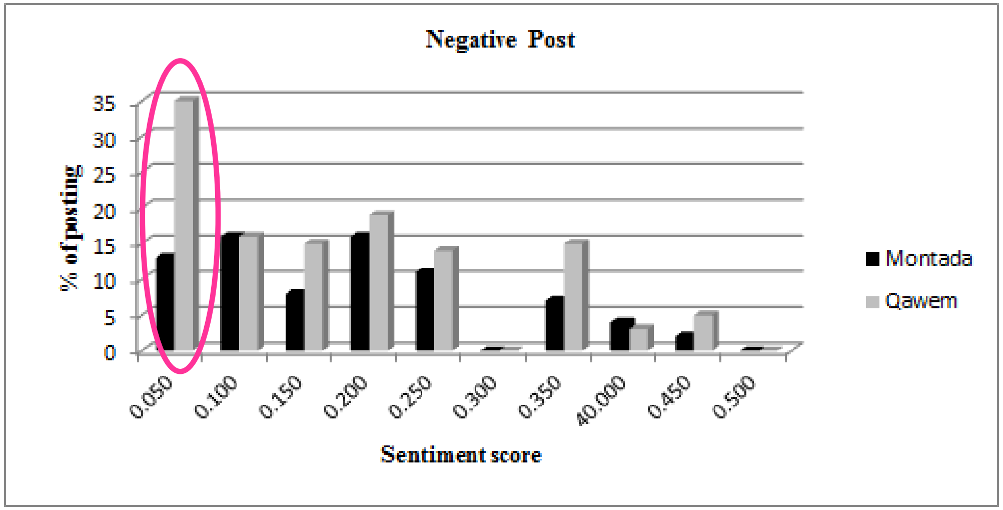


← Top high frequency words in Montada

Top high frequency words in Qawem →

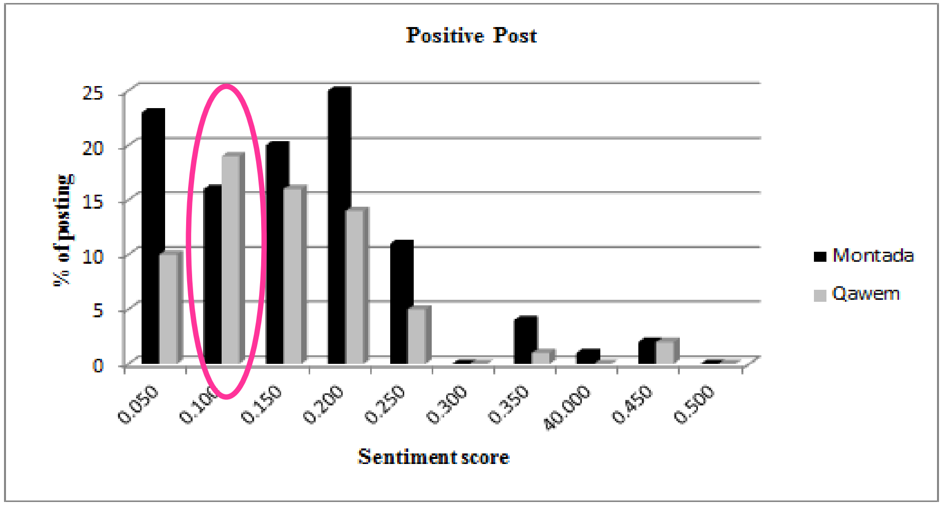


Results (2)



← Negative scores of sentiment analysis

Positive scores of sentiment analysis →



Conclusion

- Two web forums “Montada” and “Qawem” were chosen because their contents related to radicalisation.
- System was developed by using Python programming language, SentiWordNet, WordNet and NLTK.
- From the overall results, Qawem has the contents that related to radial Islamic ideology more than Montada.
- SentiWordNet could be used for analyse contents derived from web forums.

Future Work

- Word Sense Ambiguity will be research in more details.
- Annotators who are native speaker of Arabic will be asked to provides ratings of sentences, in order to compare these with the results generated via this experiment.

Any Question?

Thank you!

Humans annotation

Negative	Neutral	Positive	No meaning
HA 1 HA 5	HA 4	HA 2	HA 3

POS tagging labels

POS Meaning	POS Tag	SentiWordNet Tag
Verb	VB, VBD, VBG, VBN, VBP, VBZ	v
Noun (s)	NN, NNS, NNP, NNPS	n
Adverb (s)	RB, RBR, RBS	r
Adjective (s)	JJ, JJR, JJS	a

Humans annotation

Stopwords
['i', 'me', 'my', 'myself', 'we', 'our', 'ours', 'ourselves', 'you', 'your', 'yours', 'yourself', 'yourselves', 'he', 'him', 'his', 'himself', 'she', 'her', 'hers', 'herself', 'it', 'its', 'itself', 'they', 'them', 'their', 'theirs', 'themselves', 'what', 'which', 'who', 'whom', 'this', 'that', 'these', 'those', 'am', 'is', 'are', 'was', 'were', 'be', 'been',…]

Example of POS tagging

We will clean all the zones of unclean Americans and Suduis.*

('We', 'PRP')	('will', 'MD')	('clean', 'VB'),
('all', 'DT')	('the', 'DT')	('zones', 'NNS')
('of', 'IN')	('unclean', 'JJ')	('Americans', 'NNPS')
('and', 'CC')	('Suduis', 'NNPS')	

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