



SENTIMENTAL ANALYSIS


PRESENTED BY [REDACTED]

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INTRODUCTION

- TODAY WE THE TOPIC DISCUSSED WILL BE SENTIMENT OF TEXT
 - HOW FAR WE HAVE COME IN THE FIELD OF SENTIMENTAL ANALYSIS
 - WHAT ARE THE USES AND WHAT MY RESEARCH INCLUDE
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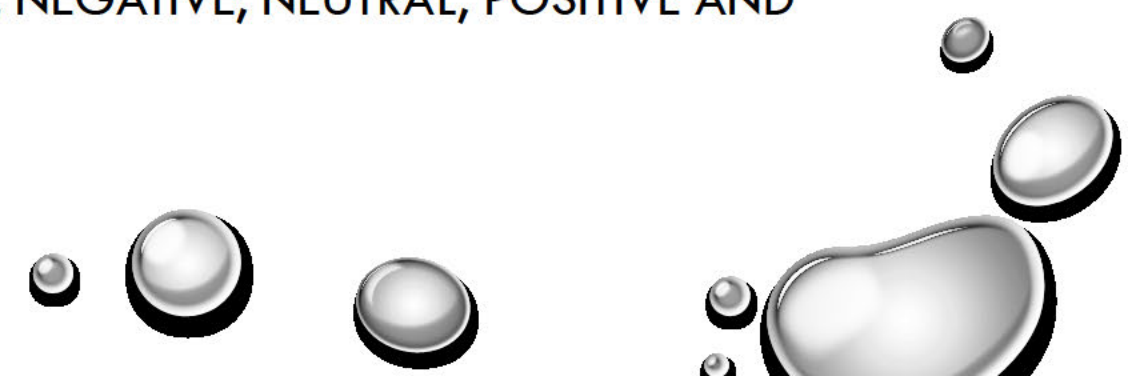


THE PROBLEM

- THE PROBLEM ADDRESSED IS THAT UNTIL RECENTLY ONLY HUMANS HAVE BEEN ABLE TO GET THE EMOTION OF ANOTHER HUMAN
 - A CLASSIC EXAMPLE IS THAT A COMPUTER CAN DO THINGS MUCH QUICKER AND EFFICIENTLY THAN A HUMAN CAN BUT NEVER BEEN ABLE TO PROCESS EMOTION
 - THE QUESTION IS, HOW CAN WE NOW DEPICT EMOTION FROM GIVEN INFORMATION ?
- 




PROBLEM FINDINGS

- THROUGH RESEARCH I FOUND METHODOLOGIES SUCH AS NATURAL LANGUAGE PROCESSING (NLP) HAS TAKEN A BIG STEP INTO SOLVING THE PROBLEM.
 - NLP BREAKS DOWN A SENTENCE AND TAGS THE WORD ACCORDINGLY TO WHAT THEY ARE, FOR EXAMPLE NAME ENTITY RECOGNITION WILL TAG A WORD IF IT'S A PERSON, LOCATION, ORGANIZATION ETC..
 - SENTIMENTAL ANALYSIS IS A ANNOTATOR OF NLP AND IT LABELS EVERY WORD IN A SENTENCE WITH EITHER 5 OPTIONS, (VERY NEGATIVE, NEGATIVE, NEUTRAL, POSITIVE AND VERY POSITIVE)
- 




SENTIMENT SYSTEM

- THE SYSTEM USES AN API TO PROCESS THE TEXT GIVEN TEXT
 - GIVES THE USER DIFFERENT INPUT METHODS
 - OUTPUTS THE SENTIMENT OF THE TEXT IN VARIOUS FORMS FOR THE USER
- 



TOOLS & INPUT

- STANFORD CORE NLP HAS BEEN THE TOOL OF CHOICE DUE TO ITS VERSATILITY AND THE FACT THAT IT HAS SENTIMENTAL ANALYSIS AS ONE OF ITS ANNOTATORS
 - WITH THE SYSTEM BUILT, 3 DIFFERENT INPUTS METHODS ARE AVAILABLE FOR THE USER
 - TEXT INPUT, THIS ALLOWS THE USER TO ENTER TEXT STRAIGHT INTO THE PROGRAM TO BE ANALYZED
 - FILE INPUT, ONCE THIS OPTION IS SELECTED A TEXT FILE IS PROCESSED AND ANALYZED
 - FINALLY THE USER HAS THE OPTION TO ENTER A URL LINK WHICH READS THE WEB PAGE AND ANALYSES IT
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EXAMPLE OF INPUT

```
Hi and welcome to a sentimental analysis tool (prototype).
```

```
Select which method of analysis you want to run.
```

```
Text Input=1
```

```
Url input=2
```

```
File input=3
```


IN-DEPTH SENTIMENTAL ANALYSIS

```
Please enter text
This is a example test, im happy!
Sentence #1 (9 tokens, sentiment: Very positive):
This is a example test, im happy!
[Text=This CharacterOffsetBegin=0 CharacterOffsetEnd=4 PartOfSpeech=DT SentimentClass=Neutral]
[Text=is CharacterOffsetBegin=5 CharacterOffsetEnd=7 PartOfSpeech=VBZ SentimentClass=Neutral]
[Text=a CharacterOffsetBegin=8 CharacterOffsetEnd=9 PartOfSpeech=DT SentimentClass=Neutral]
[Text=example CharacterOffsetBegin=10 CharacterOffsetEnd=17 PartOfSpeech=NN SentimentClass=Neutral]
[Text=test CharacterOffsetBegin=18 CharacterOffsetEnd=22 PartOfSpeech=NN SentimentClass=Neutral]
[Text=, CharacterOffsetBegin=22 CharacterOffsetEnd=23 PartOfSpeech=, SentimentClass=Neutral]
[Text=im CharacterOffsetBegin=24 CharacterOffsetEnd=26 PartOfSpeech=RB SentimentClass=Neutral]
[Text=happy CharacterOffsetBegin=27 CharacterOffsetEnd=32 PartOfSpeech=JJ SentimentClass=Very positive]
[Text=! CharacterOffsetBegin=32 CharacterOffsetEnd=33 PartOfSpeech= SentimentClass=Neutral]
```

IN THIS EXAMPLE WE CAN SEE HOW MY PROGRAM WORKS, IT GIVES EVERY WORD A SENTIMENTAL SCORE WHICH CAN BE SEEN CIRCLED IN BLUE IN THE IMAGE. IT CAN ALSO BEEN SEEN THAT ONLY ONE OF THE WORDS IS VERY POSETIVE AND THE REST IS NUTERAL YET THE OVERALL SENTIMENT OF THE SENTENCE IS VERY POSETIVE.



RESULTS

- TESTING DIFFERENT TEXT EXAMPLES HAS GIVEN SURPRISING RESULTS, THE PROGRAM IS GOOD AT JUDGING A SENTENCE THAT IS CLEAR WITH ITS SENTIMENT
 - HERE ARE SOME EXAMPLES OF RESULTS WHICH THE PROGRAM HAD NO PROBLEM DRAWING ITS TRUE EMOTION.
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SENTIMENT RESULT EXAMPLES

- POSITIVE REVIEW ANALYZED

The overall sentiment of the text is Positive

```
Please enter text
Absolutely amazing. I was worried about how Cumberbatch portrayed Strange but he did an excellent job. Great orig

Sentence #1 (3 tokens, sentiment: Positive):
Absolutely amazing.
[Text=Absolutely CharacterOffsetBegin=0 CharacterOffsetEnd=10 PartOfSpeech=RB SentimentClass=Positive]
[Text=amazing CharacterOffsetBegin=11 CharacterOffsetEnd=18 PartOfSpeech=JJ SentimentClass=Very positive]
[Text= . CharacterOffsetBegin=18 CharacterOffsetEnd=19 PartOfSpeech=. SentimentClass=Neutral]
(ROOT
  (FRAG
    (NP (RB Absolutely) (JJ amazing))
    (. )))

root(ROOT-0, amazing-2)
advmod(amazing-2, Absolutely-1)
punct(amazing-2, .-3)

Sentence #2 (15 tokens, sentiment: Positive):
I was worried about how Cumberbatch portrayed Strange but he did an excellent job.
[Text=I CharacterOffsetBegin=20 CharacterOffsetEnd=21 PartOfSpeech=PRP SentimentClass=Neutral]
[Text=was CharacterOffsetBegin=22 CharacterOffsetEnd=25 PartOfSpeech=VBD SentimentClass=Neutral]
[Text=worried CharacterOffsetBegin=26 CharacterOffsetEnd=33 PartOfSpeech=VBN SentimentClass=Neutral]
[Text=about CharacterOffsetBegin=34 CharacterOffsetEnd=39 PartOfSpeech=IN SentimentClass=Neutral]
[Text=how CharacterOffsetBegin=40 CharacterOffsetEnd=43 PartOfSpeech=WRB SentimentClass=Neutral]
[Text=Cumberbatch CharacterOffsetBegin=44 CharacterOffsetEnd=55 PartOfSpeech=NNP SentimentClass=Neutral]
[Text=portrayed CharacterOffsetBegin=56 CharacterOffsetEnd=65 PartOfSpeech=VBD SentimentClass=Neutral]
[Text=Strange CharacterOffsetBegin=66 CharacterOffsetEnd=73 PartOfSpeech=JJ SentimentClass=Neutral]
[Text=but CharacterOffsetBegin=74 CharacterOffsetEnd=77 PartOfSpeech=CC SentimentClass=Neutral]
[Text=he CharacterOffsetBegin=78 CharacterOffsetEnd=80 PartOfSpeech=PRP SentimentClass=Neutral]
[Text=did CharacterOffsetBegin=81 CharacterOffsetEnd=84 PartOfSpeech=VBD SentimentClass=Neutral]
[Text=an CharacterOffsetBegin=85 CharacterOffsetEnd=87 PartOfSpeech=DT SentimentClass=Neutral]
[Text=excellent CharacterOffsetBegin=88 CharacterOffsetEnd=97 PartOfSpeech=JJ SentimentClass=Very positive]
[Text=job CharacterOffsetBegin=98 CharacterOffsetEnd=101 PartOfSpeech=NN SentimentClass=Neutral]
[Text= . CharacterOffsetBegin=101 CharacterOffsetEnd=102 PartOfSpeech=. SentimentClass=Neutral]
(ROOT
  (S
    (NP (PRP I))
    (VP
      (VBD was)
      (S
        (NP (PRP he))
        (VP
          (VBD did)
          (NP (DT an) (JJ excellent) (NN job))
          (. .)))
      (. .)))
    (. .)))

root(ROOT-0, excellent-9)
advmod(excellent-9, worried-3)
advmod(excellent-9, about-4)
advmod(excellent-9, how-5)
advmod(excellent-9, portrayed-7)
advmod(excellent-9, Cumberbatch-6)
advmod(excellent-9, Strange-8)
advmod(excellent-9, but-9)
advmod(excellent-9, he-10)
advmod(excellent-9, did-11)
advmod(excellent-9, an-12)
advmod(excellent-9, job-13)
advmod(excellent-9, .-14)
punct(excellent-9, .-15)
```

SENTIMENT RESULT EXAMPLE

- NEGATIVE REVIEW ANALYZED

The overall sentiment of the text is Negative

```
Please enter text
I was not a fan at all of this movie and ended up spending the majority of it looking away nauseous. The
Sentence #1 (22 tokens, sentiment: Negative):
I was not a fan at all of this movie and ended up spending the majority of it looking away nauseous.
[Text=I CharacterOffsetBegin=0 CharacterOffsetEnd=1 PartOfSpeech=PRP SentimentClass=Neutral]
[Text=was CharacterOffsetBegin=2 CharacterOffsetEnd=5 PartOfSpeech=VBD SentimentClass=Neutral]
[Text=not CharacterOffsetBegin=6 CharacterOffsetEnd=9 PartOfSpeech=RB SentimentClass=Negative]
[Text=a CharacterOffsetBegin=10 CharacterOffsetEnd=11 PartOfSpeech=DT SentimentClass=Neutral]
[Text=fan CharacterOffsetBegin=12 CharacterOffsetEnd=15 PartOfSpeech=NN SentimentClass=Positive]
[Text=at CharacterOffsetBegin=16 CharacterOffsetEnd=18 PartOfSpeech=IN SentimentClass=Neutral]
[Text=all CharacterOffsetBegin=19 CharacterOffsetEnd=22 PartOfSpeech=DT SentimentClass=Neutral]
[Text=of CharacterOffsetBegin=23 CharacterOffsetEnd=25 PartOfSpeech=IN SentimentClass=Neutral]
[Text=this CharacterOffsetBegin=26 CharacterOffsetEnd=30 PartOfSpeech=DT SentimentClass=Neutral]
[Text=movie CharacterOffsetBegin=31 CharacterOffsetEnd=36 PartOfSpeech=NN SentimentClass=Neutral]
[Text=and CharacterOffsetBegin=37 CharacterOffsetEnd=40 PartOfSpeech=CC SentimentClass=Neutral]
[Text=ended CharacterOffsetBegin=41 CharacterOffsetEnd=46 PartOfSpeech=VBN SentimentClass=Neutral]
[Text=up CharacterOffsetBegin=47 CharacterOffsetEnd=49 PartOfSpeech=RP SentimentClass=Neutral]
[Text=spending CharacterOffsetBegin=50 CharacterOffsetEnd=58 PartOfSpeech=VBG SentimentClass=Neutral]
[Text=the CharacterOffsetBegin=59 CharacterOffsetEnd=62 PartOfSpeech=DT SentimentClass=Neutral]
[Text=majority CharacterOffsetBegin=63 CharacterOffsetEnd=71 PartOfSpeech=NN SentimentClass=Neutral]
[Text=of CharacterOffsetBegin=72 CharacterOffsetEnd=74 PartOfSpeech=IN SentimentClass=Neutral]
[Text=it CharacterOffsetBegin=75 CharacterOffsetEnd=77 PartOfSpeech=PRP SentimentClass=Neutral]
[Text=looking CharacterOffsetBegin=78 CharacterOffsetEnd=85 PartOfSpeech=VBG SentimentClass=Neutral]
[Text=away CharacterOffsetBegin=86 CharacterOffsetEnd=90 PartOfSpeech=RP SentimentClass=Neutral]
[Text=nauseous CharacterOffsetBegin=91 CharacterOffsetEnd=99 PartOfSpeech=NNS SentimentClass=Neutral]
[Text=. CharacterOffsetBegin=99 CharacterOffsetEnd=100 PartOfSpeech=., SentimentClass=Neutral]
```


SENTIMENT RESULT EXAMPLE

- POSITIVE/NEGATIVE TEXT ANALYZED
- THIS SENTENCE MADE ME THINK TWICE, THE SENTENCE CAN BE PERCEIVED IN TWO DIFFERENT WAYS, IN BOTH POSITIVE AND NEGATIVE.

```
Please enter text
hey you look like you need a shower
Sentence #1 (8 tokens, sentiment: Positive):
hey you look like you need a shower
[Text=hey CharacterOffsetBegin=0 CharacterOffsetEnd=3 PartOfSpeech=VB SentimentClass=Neutral]
[Text=you CharacterOffsetBegin=4 CharacterOffsetEnd=7 PartOfSpeech=PRP SentimentClass=Neutral]
[Text=look CharacterOffsetBegin=8 CharacterOffsetEnd=12 PartOfSpeech=VBP SentimentClass=Neutral]
[Text=like CharacterOffsetBegin=13 CharacterOffsetEnd=17 PartOfSpeech=IN SentimentClass=Neutral]
[Text=you CharacterOffsetBegin=18 CharacterOffsetEnd=21 PartOfSpeech=PRP SentimentClass=Neutral]
[Text=need CharacterOffsetBegin=22 CharacterOffsetEnd=26 PartOfSpeech=VBP SentimentClass=Neutral]
[Text=a CharacterOffsetBegin=27 CharacterOffsetEnd=28 PartOfSpeech=DT SentimentClass=Neutral]
[Text=shower CharacterOffsetBegin=29 CharacterOffsetEnd=35 PartOfSpeech=NN SentimentClass=Neutral]
(ROOT
  (S
    (VP (VB hey)
      (SBAR
        (S
          (NP (PRP you))
          (VP (VBP look)
            (SBAR (IN like)
              (S
                (NP (PRP you))
                (VP (VBP need)
                  (NP (DT a) (NN shower))))))))))
    root(ROOT-0, hey-1)
    nsubj(look-3, you-2)
    ccomp(hey-1, look-3)
    mark(need-6, like-4)
    nsubj(need-6, you-5)
    advcl:like(look-3, need-6)
    det(shower-8, a-7)
    dobj(need-6, shower-8)

The overall sentiment of the text is Positive
```



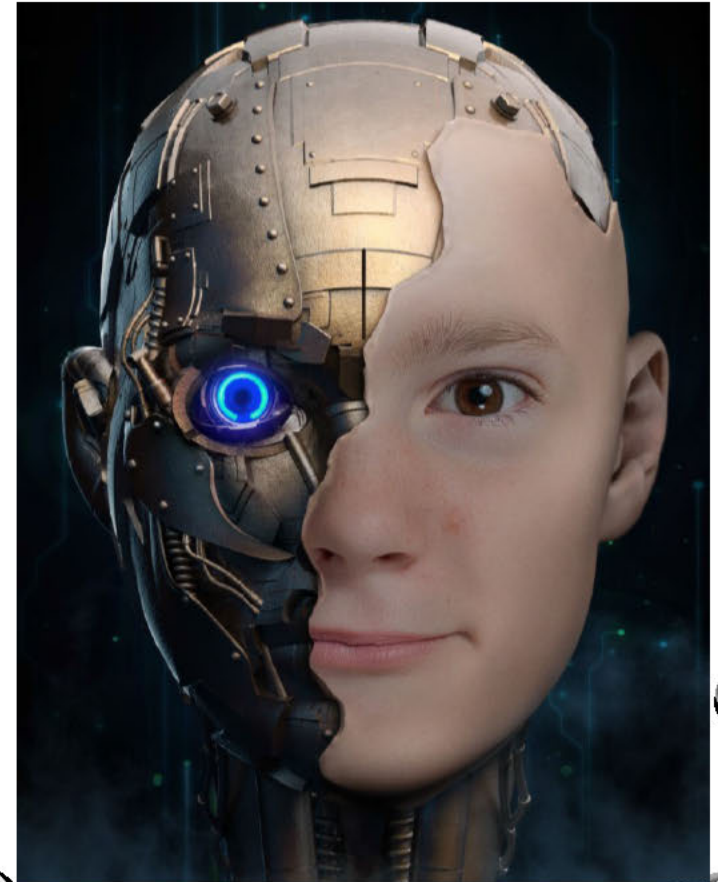
RELATED RESEARCH

- FROM THE LAST RESULT WE SAW HOW IT COULD BE SIMPLE FOR THE PROGRAM TO MAKE A JUDGMENT WHICH IS NOT AS PLAIN AS IT SEEMS.
- THIS GOT ME TO DO SOME RELEVANT RESEARCH INTO ROBOTICS, HOW THE EXTRA INFORMATION ABOUT THE USER IS A BIG FACTOR INTO HOW EMOTION IS CAPTURED CORRECTLY.



RELATED RESEARCH

- WITH THIS DEVELOPMENT IN NLP WE CAN SEE HOW WE ARE EVER SO CLOSE TO ACHIEVE EMOTIONS WITH ROBOTS.
- WITH THE RIGHT TOOLS SUCH AS FACIAL RECOGNITION FOR THE ROBOT TO RECOGNIZE THE PERSON, THIS WAY THE SOFTWARE CAN KNOW HOW TO CHANGE ITS ALGORITHM TO JUDGE THE CONTEXT.
- VOICE RECOGNITION TO TRANSLATE THE WORDS HEARD INTO WORDS AND FINALLY TO TAKE THE WORDS AND RUN IT THROUGH THE SOFTWARE.





CONCLUSION

- TO CONCLUDE, SENTIMENTAL ANALYSIS HAS COME A FAR WAY AND HAS IMPROVED THE WAY WE DATA MINE AND WILL CONTINUE TO DO SO. THE TRUE EXTENT OF SENTIMENTAL ANALYSIS HAS YET NOT BEEN MET DUE TO ITS HUGE POTENTIAL IN INDUSTRY.



The image features a white background with the text "THANK YOU FOR YOUR TIME" centered in a black, sans-serif font. The corners of the image are decorated with several 3D-rendered bubbles of varying sizes. These bubbles have a metallic, reflective surface with highlights and shadows, giving them a realistic appearance. They are clustered in the top-left, top-right, and bottom-right corners, while the bottom-left corner is empty.

THANK YOU FOR YOUR TIME