# Summary Report (12/18/2014)

## Overview

Things I have done:

* Tried Opinosis (an abstract summarization system)

## Opinosis

The software introduced in the paper (Ganesan et al., 2010) is available online. Thus, I just downloaded it and applied it to my data set.

First, I changed the default parameter “redundancy” from 2 to 1, because when setting with 2, the results of about half of the prompts are nothing.

Second, “max\_summary” is setting to be 4 to be consistent with my experiments.

Third, beyond just feeding the original sentences into Opinosis, I adapt it to work for Phrases by first extracting the phrases and then send them to Opinosis, yielding OpinosisPhrase (just like the PhraseMEAD).

Last, add a period in the end of the sentence/phrase because Opinosis needs it to detect the end of a sentence.

### Results

The last two rows are the results of Opinosis.



### Output Examples:

***Human Summary:***

1) Graphs of attraction/ repulsive & atomic separation [10]

2) Properties and equations with bond strength [7]

3) Coefficient of thermal expansion [6]

4) Activity part III [4]

#### Opinosis:

#### [1] elastic modulus

#### [2] i didn 't understand the attractive and repulsive force graphs from the third slide

#### [3] graphs and equations are hard to understand because i 'm unfamiliar with the terms and equations

#### [4] i was unsure of how to the values but a group member explained it more clearly

#### OpinosisPhrase:

#### [1] elastic modulus

#### [2] coefficient thermal expansion graph

#### [3] graphs of attractive + repulsive forces and attraction / repulsive & interatomic separation

#### [4] thermal expansion relationship to bond strength

### Observations:

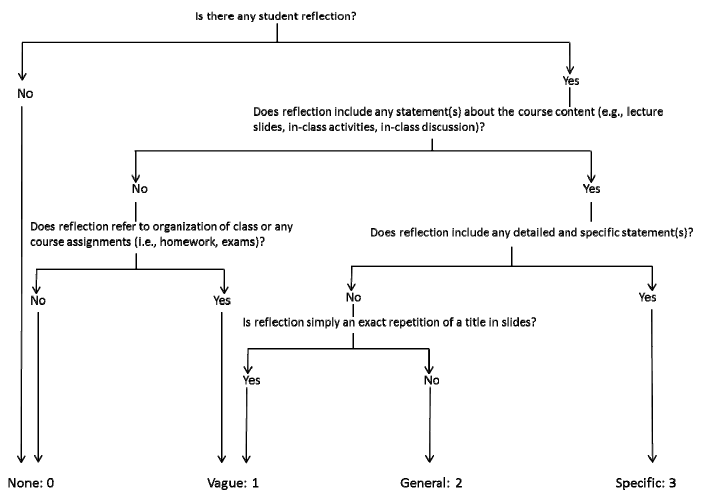
The results of Opinosis are not good. There are some possible reasons:

* It doesn’t consider the word forms
* It doesn’t consider the semantic similarity
* No parameter tuning (definition of valid path)

## Response Quality

### Problem Analysis

#### Coding Schema



In addition, a label ‘a’ is added to say “I understood everything”.

#### Analysis

* ‘1’ does not only mean “vague”, it could also mean “homework”, “exams”
* Both “1” and “2” are NOT “specific” and the difference is whether is it a repetition of a title (extern resources)

#### Label Distribution

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| label | 0 | 1 | 2 | 3 | ‘a’ |
| N | 356 | 225 | 250 | 227 | 91 |

### Problem Modeling

5-way classification Problem

### Feature Sets

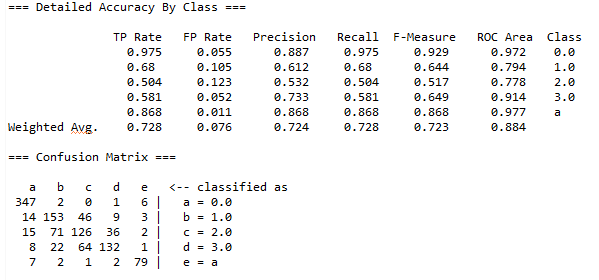
* Word Count
* Unigrams
* Specificity
  + The output of speciteller is a probability whether an input sentence is specific or not. I used the probability as a feature or changed it to a binary value (True if p>=0.5)

### Results

10-fold Cross Validation + SVM

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | TP Rate | FP Rate | Precision | Recall | F-Measure | ROC Area |
| Word Count | 0.536 | 0.161 | 0.394 | 0.536 | 0.444 | 0.718 |
| Ngram | 0.674 | 0.104 | 0.665 | 0.674 | 0.66 | 0.848 |
| Word Count + Ngram | 0.688 | 0.095 | 0.677 | 0.688 | 0.677 | 0.86 |
| speciteller\_Prob | 0.336 | 0.261 | 0.232 | 0.336 | 0.246 | 0.546 |
| speciteller\_Binary | 0.368 | 0.261 | 0.188 | 0.368 | 0.235 | 0.553 |
| ALL | **0.728†** | **0.076** | **0.724†** | **0.728†** | **0.723†** | **0.884†** |

**†** means it is significant different than both Ngram and (Word Count + Ngram) using a paired T-Test.



# Paper I read

Li, J. J., & Nenkova, A. (2015). Fast and Accurate Prediction of Sentence Specificity. In *Proceedings of the Twenty-Ninth Conference on Artificial Intelligence (AAAI)*.

Filippova, K. (2010). Multi-sentence compression: finding shortest paths in word graphs. *Proceedings of the 23rd International Conference on Computational Linguistics*, 322–330. Retrieved from http://dl.acm.org/citation.cfm?id=1873781.1873818

Ganesan, K., Zhai, C., & Han, J. (2010). Opinosis: a graph-based approach to abstractive summarization of highly redundant opinions. In *Proceedings of the 23rd International Conference on Computational Linguistics* (pp. 340–348). Beijing, China: Association for Computational Linguistics. Retrieved from http://dl.acm.org/citation.cfm?id=1873781.1873820 <http://mandrillapp.com/track/click/11410371/www.mendeley.com?p=eyJzIjoiSGFQNGRoczZyMkE4SmpmOVcwMEpHaGFEYkRVIiwidiI6MSwicCI6IntcInVcIjoxMTQxMDM3MSxcInZcIjoxLFwidXJsXCI6XCJodHRwOlxcXC9cXFwvd3d3Lm1lbmRlbGV5LmNvbVxcXC9zaGFyZVxcXC9kb2N1bWVudFxcXC9pbnZpdGVcXFwvMDIyMjRhMTYxYlxcXC8_dXRtX21lZGl1bT1lbWFpbCZ1dG1fc291cmNlPXRyYW5zYWN0aW9uYWwmdXRtX2NhbXBhaWduPXNoYXJlJTJGaW52aXRhdGlvbi1kb2N1bWVudFwiLFwiaWRcIjpcImQ4NTNiMWU0NTgwNzQ0NDhiNGFlZTVhMjlkYzk2MzM3XCIsXCJ1cmxfaWRzXCI6W1wiMGY1Njg4NzU1ZjFjYzEyNmI4MThlZTI5ZGQzZGRlYzUwZTU4NGJlN1wiXX0ifQ>