Domain Independent Textual Sentiment Analysis

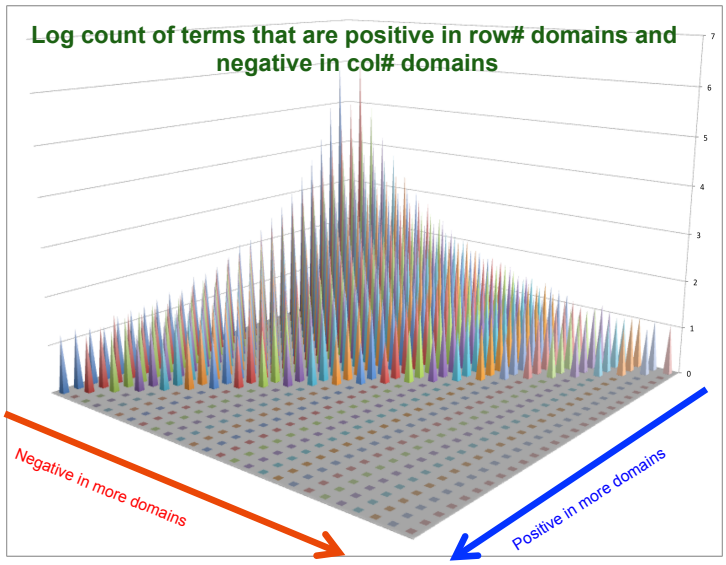
Justin Martineau and Tim Finin

Textual Sentiment Analysis is the task of determining the opinion an author is expressing about the subject of his writing. Many researchers use Bag of Words text classification techniques to address this problem. However, when text classifiers are used on documents about a different kind of subject matter than they were trained on their accuracy drops noticeably. We describe a domain independence verification algorithm that identifies domain independent sentimental text features. Classification using these features produces the highest domain adaption accuracy results published to date.

Definition:

Domain independent sentiment signals are words or word pairs that are present in and have the same sentimental orientation ***in multiple domains***.

Domain Independence Statistics:



- Domain Independence is a matter of degree.
- # of domain independent words drops off logarithmically with strength

Approach:

1. Find and Weight Strong In-Domain Sentiment Signals:

Use Delta IDF. Take the difference of the IDF scores for words in positive documents with the IDF in the negative documents. Produce a weight vector for these words using this score. Do this for 3 domains.

2. Verify Domain Independence with Other Domains:

Create a new weight vector:

1. Remove words that do not occur in all 3 vectors
2. Remove words if their sign is different in any of the 3 in-domain vectors
3. Multiply word scores from the 3 in-domain vectors together. (Ensure no sign flip.)

3. Classify in Target Domain

1. Take Dot Product of weight vector with document vector
2. If > 0 say positive
3. If < 0 say negative
4. Otherwise make no decision

Positive Apparel Reviews

- the shirts are what i had asked for . they are sturdy and well made . i would buy more if i needed more . well worth the money spent
- was delivered quickly , was priced right , and folded up into a small size so i could stuff it into a suitcase before going on vacation . when unfolded it held more than the suitcase . high quality material and excellent workmanship . i think i'll buy another one for a spare
- i bought a pair for my wife and she told me how warm her feet were while wearing them so i decided to buy a pair for myself . i wear them without socks as they are so warm and comfortable i think wearing socks with these shoes would get a little too warm for my feet .
- this is a fine leather bag , beautiful , comfortable ! i bought on the mfr website and saved the shipping . its a wonderful product of quality and craftsmanship ! a must have

Negative Apparel Reviews

- i want to start by saying fred fl arshipped this product very fast! ! and the transaction itself was very smooth . i do however , have extreme problems with the product itself . the product is not leather , its nylon , and it sort of looks cheap ? the inside material is sued , but that's only the lining for the base of the wallet . also , the wallet part is very hard to use . you cant really put too much in the wallet the credit card slots are a little too snug , and there is no place for my i.d. the wallet included a small " note book " but it also doesn't fi tn the wallet ? i was very excited about this product , but now i feel duped . the pictures made the wallet seem like it was of higher quality , and that it was user friendly , but it's not . i do not recommend this product
- i ordered the black one . according to the photo provided , it was supposed to be black with white seams , but when i received it , it was all black . once i put it on it fi tedperfectly . but it is simply too difficult to put on even though it is the right size .
- the swim suit was so unsatisfactory looking that i didn't even try it on . it was blue striped with a totally different blue strap that didn't go with the main color of the suit . very poor choice for a grab bag . taught me not to use grab bag shopping from this company
- i wish i did not order this one . the picture looks nice but when i got it today , i really got disappointed . when you look at it closer , the wood beads , sequins and the cloth are very cheap looking . i wish they used nicer sequins and glossy beads .

Evaluation:

- Average accuracy is 88.5 % over 21 different product categories.
- Baseline Domain Adaptation with SCL-MI is 77.8 % Accurate on 4 product categories
- Average accuracy for in-domain models is 84.5 % over 24 different product categories