Cross-Domain Reviewer Reputation Analysis based on Sentiment

Teisovi Angami, Department of Computer Science

Advisor : Prof. Yi-Shin Chen

MOTIVATION

- Sentiments are expressed differently in different domains.
  - In Amazon web store
    - JOY : more in MUSIC & Less in SOFTWARE.
    - Vice-versa for DISGUST.
- Also, Quality of a review judged is **almost uncorrelated** with its rating.
  - Concentrate on the **emotions** expressed in the reviews.

Application

- ***Recommendation systems*** *for products.*

Research Goal

To understand how emotions are expressed by a Reviewer across different domains and how it can contribute in predicting the helpfulness of reviews.

- The First part tries to target Transfer Learning based on emotions, and

- the later focuses on how we can predict the helpfulness of reviews using emotion extraction.

RELATED WORK

Cross-Domain Classification

Domain Adaptation/ Transfer Learning

- Classifier trained in one domain may not work well when applied to the other.
  - **Mismatch** between domain specific words.

- **Fangtao Li et. al. (2012)**
  - ***Used the domain of interest to reduce labeling data.***
- **Danushka Bollegala et. al. (2013)**
  - ***Used a Sentiment Sensitive Thesaurus***.
- **Cong-Kai Lin et. al. (2013)**
  - ***Taxonomy-based Regression Model for shopping websites.***

Reviewer's Reputation Analysis

- Based on helpfulness of reviews.

Helpfulness of Reviews

Sangjae Lee et al. (2013)

- ***Predicted helpfulness of online reviews using multilayer perceptron neural networks.***

Lionel Martin et al. (2014)

- ***Prediction of Helpful Reviews Using Emotions Extraction.***
- Used **20** emotions **(Geneva Wheel of Emotion).**

Erik Tromp et al. (2014)

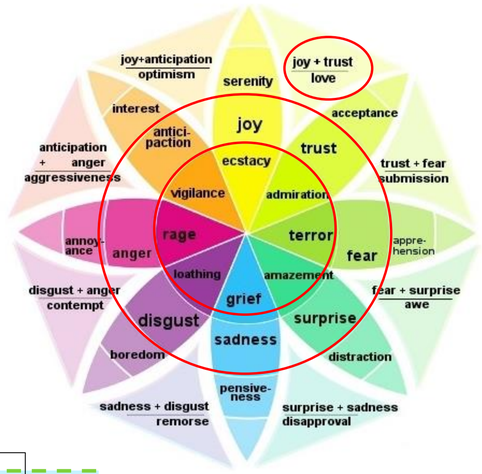
- ***Rule-Based Model algorithm to deduce emotions from texts.***
- Assign **score to emotions** in the **Plutchik** wheel of emotions.

HYPOTHESES & APPROACH

Hypotheses

Discrete emotions such as: **Trust, Fear, Anticipation and Anger** impacts judgment and decision-making outcomes.

- Hence, these emotions should contribute significantly to helpfulness of reviews.



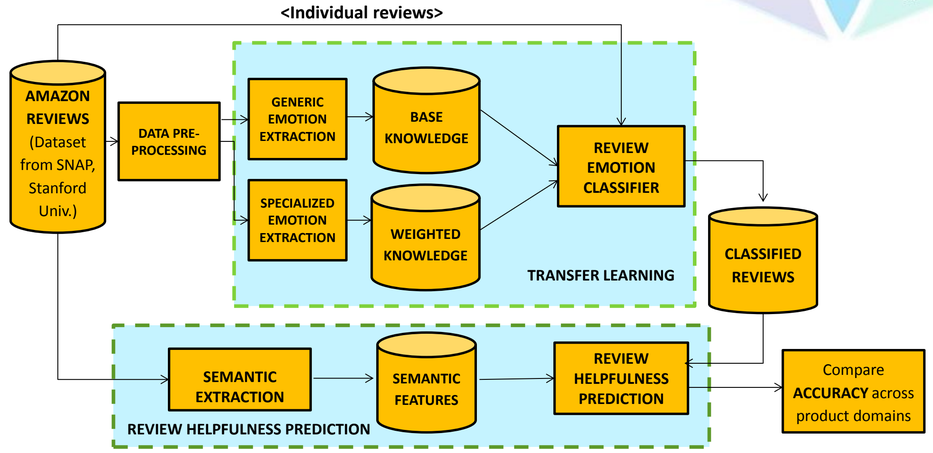
Emotion Extraction

Plutchik Wheel of emotion (1980).

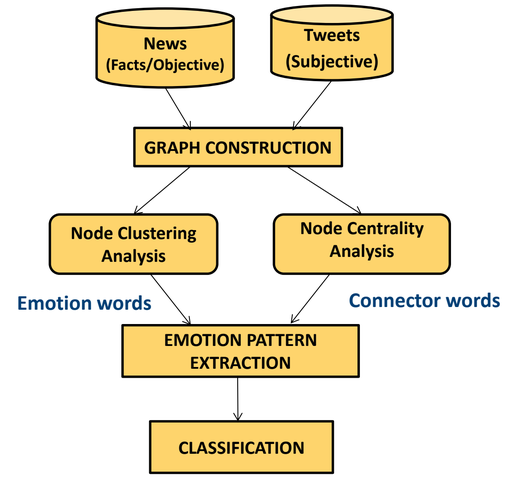
Challenges in Emotion Extraction

- *Recognition of emotions.*
- *Word Features contribution to emotion detection.*
- *Accuracy of the classifiers.*

FRAMEWORK



Emotion Extraction



(Developed by IDEA Lab, NTHU)

Features to be used for Prediction

1.Overall emotion of the review.

From 16 possible emotions.

2. Count of individual emotions identified in the review.

Breaking up long review into sentences for emotion identification.

3. Overall emotion Score for the review based on Erik Tromp et al. (2014).

EVALUATION

N-fold cross-validation.

Main Challenges

Classifier:

- Extracting the correct emotions from the reviews.
- Accuracy across domains.