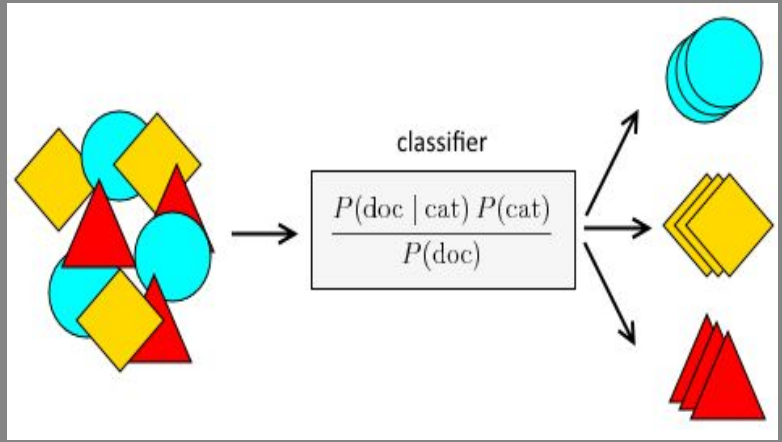
Chair Of Digital Libraries and
Web Information Systems

UNIVERSITÄT PASSAU

Twitter Text Classification



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Overview

1. Introduction
2. Implementation
3. Future Work
4. Conclusion

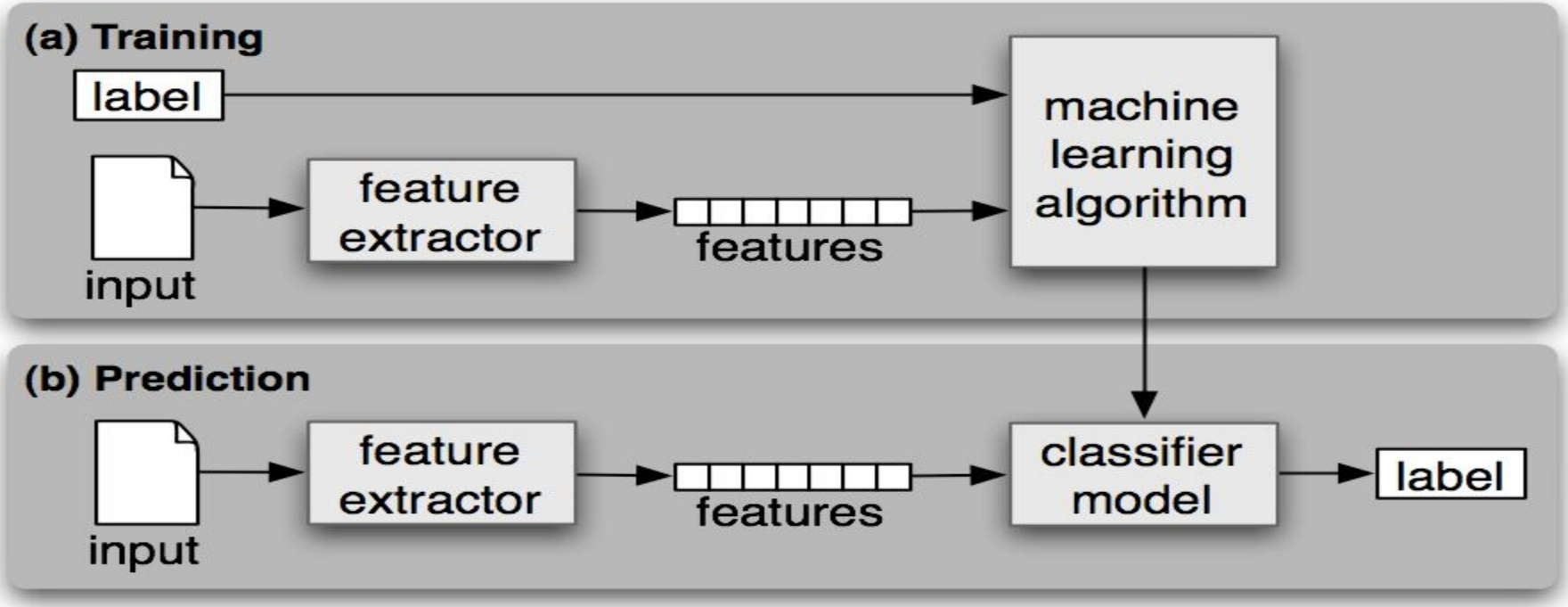
Introduction

- Text Classification
- Supervised Learning

Text Classification

The task of choosing the correct class label for a given input.

Supervised Learning



Implementation

Data Preparation and Cleaning

- The Twitter Political Corpus contains tweets that have been hand labeled for their topics, specifically, discussing politics or not discussing politics.

Twitter Political Corpus

- Then the Tweets were cleaned by removing the HTML content, non-letters, stop-words and converting it into lowercase, finally splitting into individual words

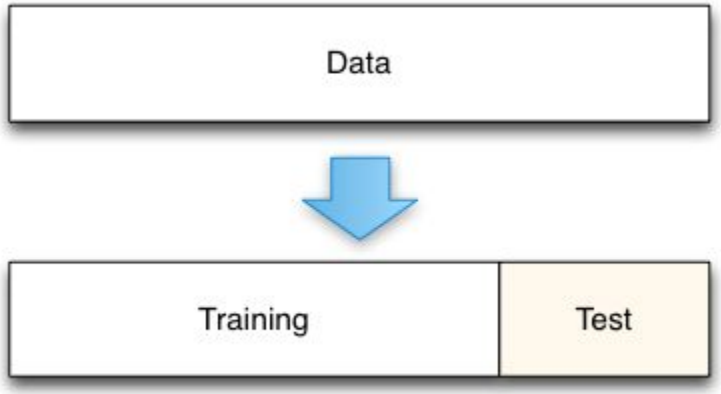
Data Pre-processing

- Count-Vectorizer

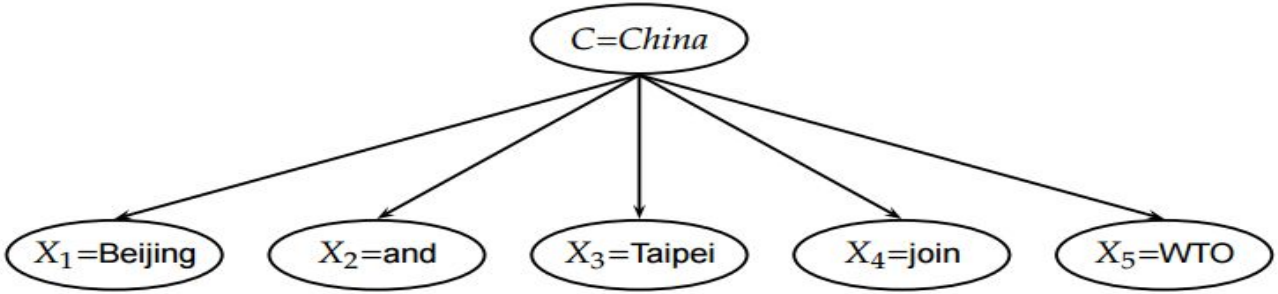
- TF-IDF

Train Test Split

Splitting the available data into random training and testing subsets, drastically reduces the number of samples which can be used for learning the model.

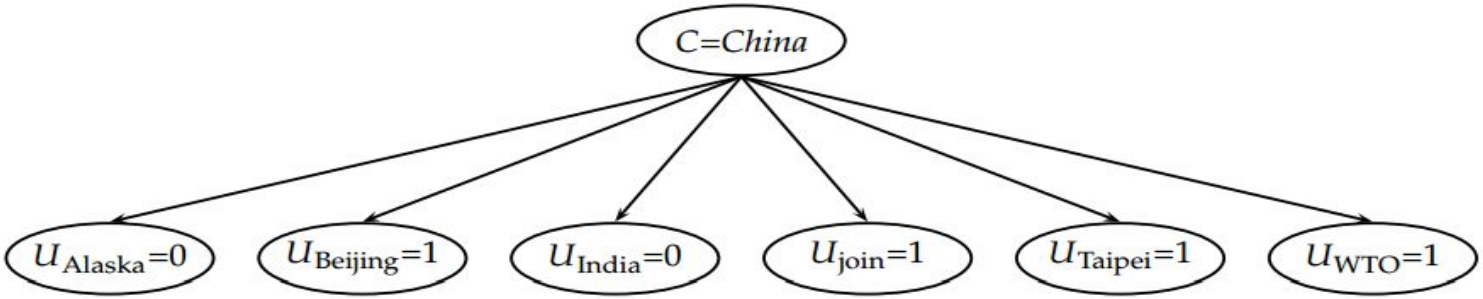


Classifier: Multinomial Naive Bayes



- Estimates the Conditional probability of a particular term.
- Consider number of occurrences of a term.

Classifiers: Bernoulli Naive Bayes



- Generates boolean indicators(0 and 1).
- Includes non-occurrence terms

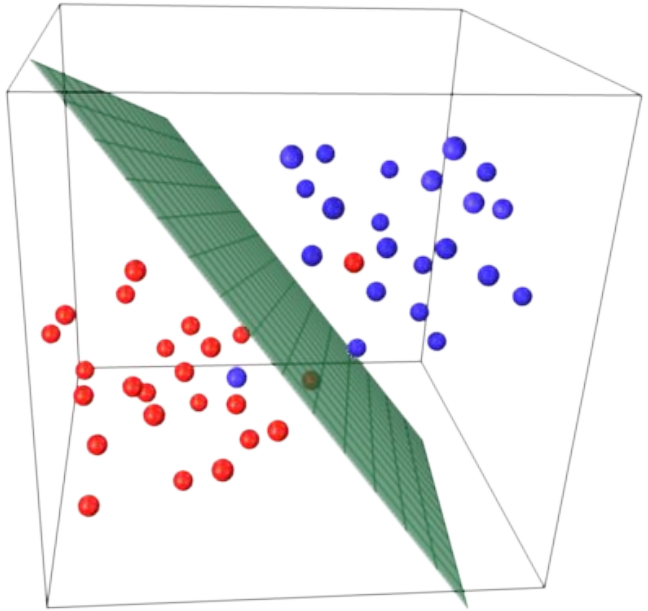
Classifiers: Bernoulli Naive Bayes

- Generates boolean indicators (0 and 1).

- Includes non-occurrence terms

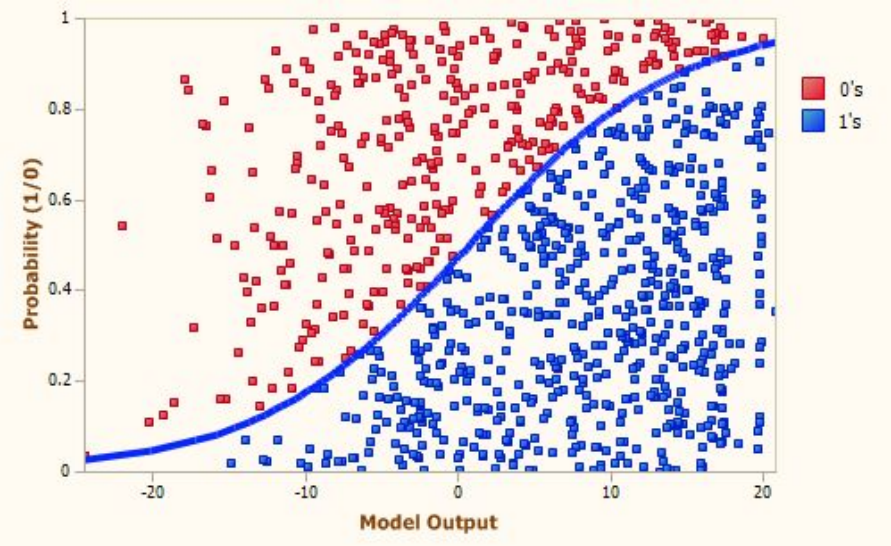
Classifiers: SVM

- Uses hyperplane for segregation
- Different “Kernel” functions depending on separating of the data points

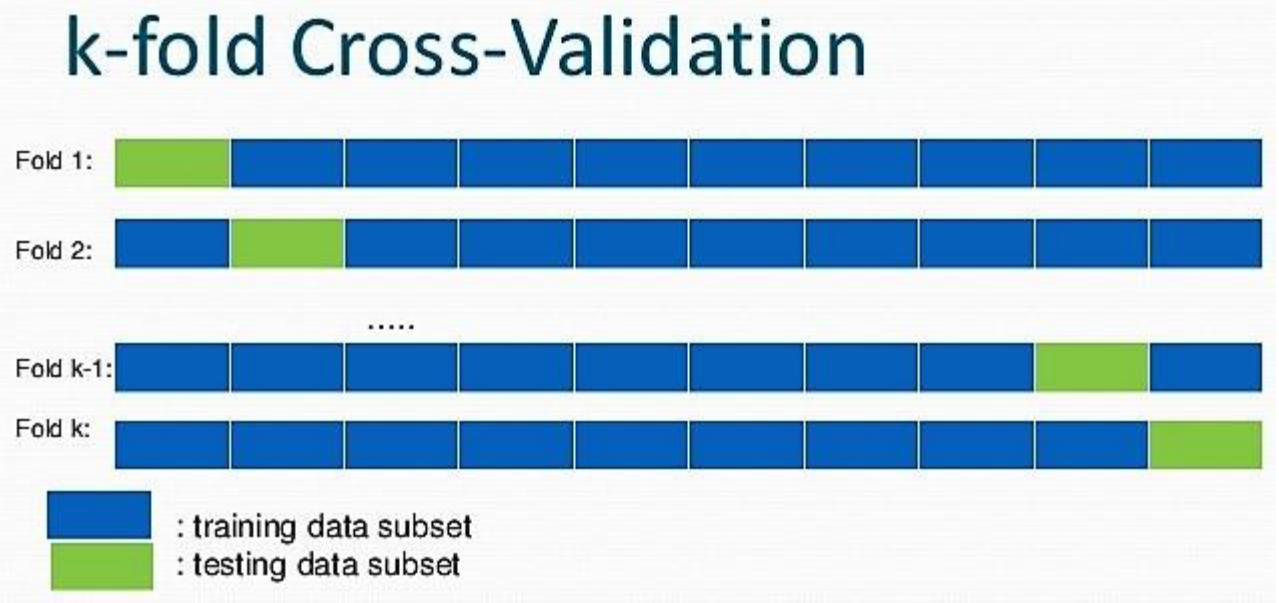


Classifier: Logistic Regression

- Desired outcome of the dependent variable can have two possible types
- Focusses on the conditional probability



Evaluation: 10-Fold Cross Validation



Evaluation: Confusion Matrix

- Describes the performance and accuracy
- Shows the number of correct and incorrect predictions made by the classifiers

Confusion Matrix		Target			
		Positive	Negative		
Model	Positive	a	b	*Positive Predictive Value*	a/(a+b)
	Negative	c	d	*Negative Predictive Value*	d/(c+d)
		Sensitivity	*Specificity*	**Accuracy** = (a+d)/(a+b+c+d)	
		a/(a+c)	d/(b+d)		

Evaluation: Classification Report

- Shows the main classification metrics
- Precision, Recall, F1-score against the Class labels

Future Work

Future Work: Sentiment Analysis

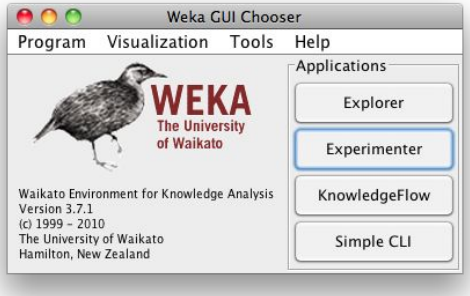
- It is a machine learning method to extract, identify, or otherwise characterize the sentiment content of a text unit and is also referred to as opinion mining.

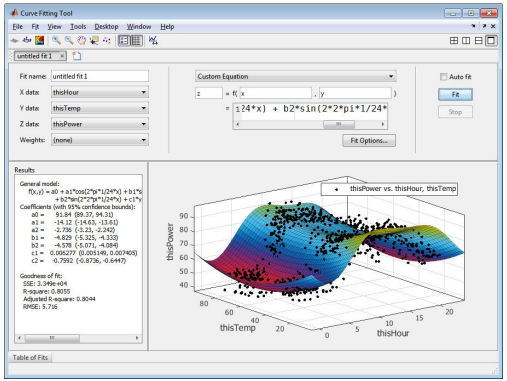
Future Work: Neural Network

- Convolution Neural Network for Text Classification.
- Keras deep learning learning libraries along with Theona / TensorFLow back-end.

Future Work: Tools

- **Tools which can be used**





Conclusion

- Comparing classifiers based on accuracy and time.
- Distinguish between political and nonpolitical tweets.
- Processing speed of the computer.
- Used Cross-validation for more accurate evaluation of the models
- Performance evaluation : concluded Logistic regression yields better accuracy.

Thank You for your Attention

Questions