# USING MACHINE LEARNING TO IDENTIFY NEGATIVE SOCIAL MEDIA POSTS

IDENTIFYING NEGATIVE WORDS COMMONLY USED ON SOCIAL MEDIA PLATFORMS AND PREDICTING IF A USER'S POST IS NEGATIVE BEFORE IT IS POSTED ONLINE

# The Problem



- Data Source: Kaggle.com, an online community for data scientist
- Dataset: Tweets from several Twitter users

**Data Collection** 

## The Process

Pre-processing

- Exploratory Data Analysis
- Train/Test split
- Natural Language Processing
- Handling Duplicates and missing values
- Feature Engineering

Model Training & Selection

- Search for best fit: Logistic Regression, Random Forest Classifier, XgBoost
- Handling imbalanced data
- Hyper parameter Optimization
- Final Model: Logistic Regression

- Model Accuracy
- Classification Report: Precision, Recall, F1 score
- Confusion Matrix
- ROC & AUC

Evaluation

# Natural Language Processing Technique

#### **Tokenization**

(Breaking each tweet into individual words)



#### **Punctuation**

(Removal of attached punctuations e.g. .,@#)



#### Stop-word

(Removal of stop words. Stop words include a, the, I, etc.)



#### Corpus

(Document term matrix with counts of word occurrence in each document)



#### Stemming

(Removal of derivational affixes. E.g. ponies → poni, caresses → caress)



#### Lemmatization

(Transforming words back to their dictionary form. For example; am, are is → be)

# The Machine Learning Outcome

queue

polic

### WORDS IDENTIFIED TO BE USED NEGATIVELY IN SOCIAL MEDIA POSTS

liber aic|putin arab inequ kkk ukchick million fakenew povey podcast sexist bigotri trump shut maga xenophobia malevot latest respond fascism histori scumbag boycottmisogyniwoman dumbracist notmypresid racism discrimin blacklivesmatt misogynist ny allah soil traitor carlpaladino comment blatantli white fascist bluelivesmatt southafrica girl world nigger go hell paladino equal daili thank jew blm bigot prejudic inhumanfemin cologn obama maledick anti bulli abus one thing nazinake

#### WORDS IDENTIFIED TO BE USED POSITIVELY IN SOCIAL MEDIA POSTS

love weekhome posit happi motiv success familibless best funenjoy weak lastmexican awesom summer bihday today youngsaturday ather day weekend prayfororlando fathersday dogblack white amaz tomorrowblack menorlandoday tonightfinal amp whitelife healthifridaysleepnight wait remain soor mornreadi

## **Model Evaluation**

- Accuracy: 95%
  - Percentage of overall correct predictions
- Precision: Pos. 0,96 , Neg. 0,78
  - Proportion of positive predictions that are actual members to the positive class
- Recall: Pos. 0,99 , Neg. 0,42
  - Proportion of positive class correctly predicted
- F1 Score: Pos. 0,98 , Neg. 0,55
  - Weighted average of the precision and recall

Receiver Operating Characteristics (ROC)

