SEEKING THE TRUTH ON THE X PLATFORM

DETECTING DISINFORMATION USING MACHINE LEARNING ALGORITHMS

CIOBANU SERGIU-TUDOR

PROBLEM STATEMENT & RESEARCH OBJECTIVES

- **The Problem:** Shift from traditional media to social platforms - conductive environment for disinformation
- **The Objective:** Develop an automated detection system using the CIC TruthSeeker 2023 dataset (Real vs. Fak News)
- **The Approach:** Prioritize data quality over model complexity - rigorouse preprocessing allows ML model to perform effectively

METHODOLOGY & DATA PIPELINE

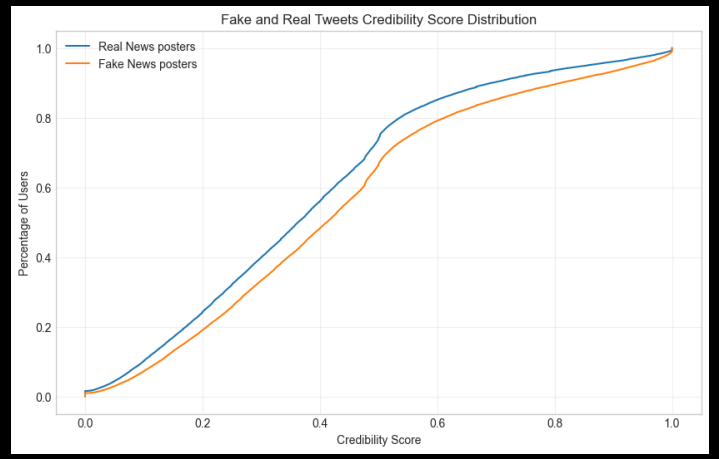
- **Data Cleaning**
  - Regex removal of noise (URLs, mentions, numerical values)
  - Normalization, Tokenization, and Stop-word removal

- **Feature Engineering**
  - **Text**: TF-IDF Vectorization to capture context
  - Metadata: Standardization for numerical features

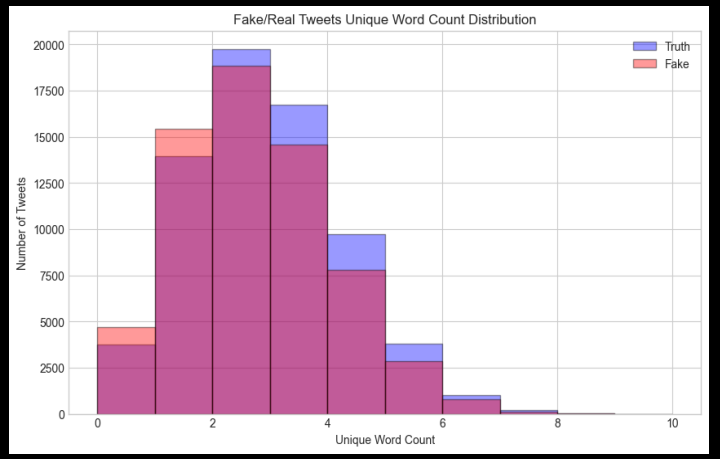
- **Feature Filtering**
  - Removed features with >70% zero values to prevent noise
  - Excluded features that indicate if a tweet is true or not

- **Models Selected:** Logistic Regression, Random Forest, and Decision Tree

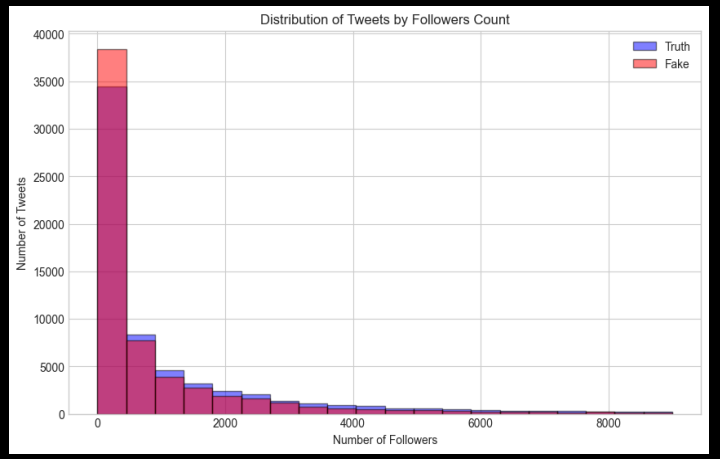
EXPLORATORY DATA INSIGHTS



Credibility Score Graph

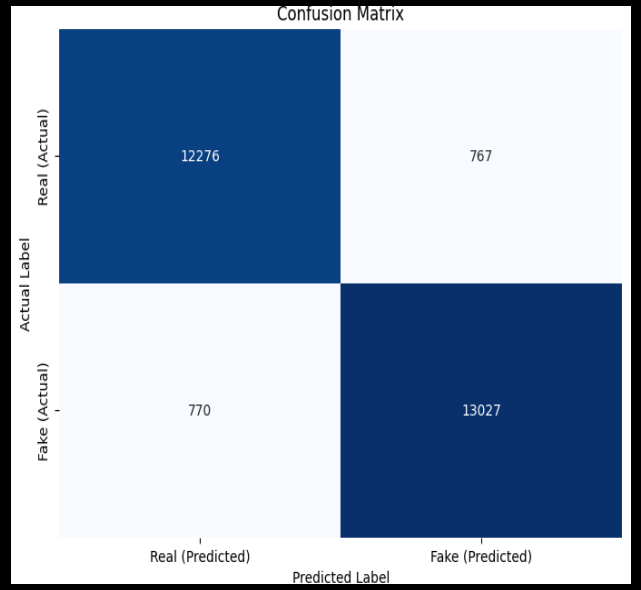


Unique Word Count Per Tweet

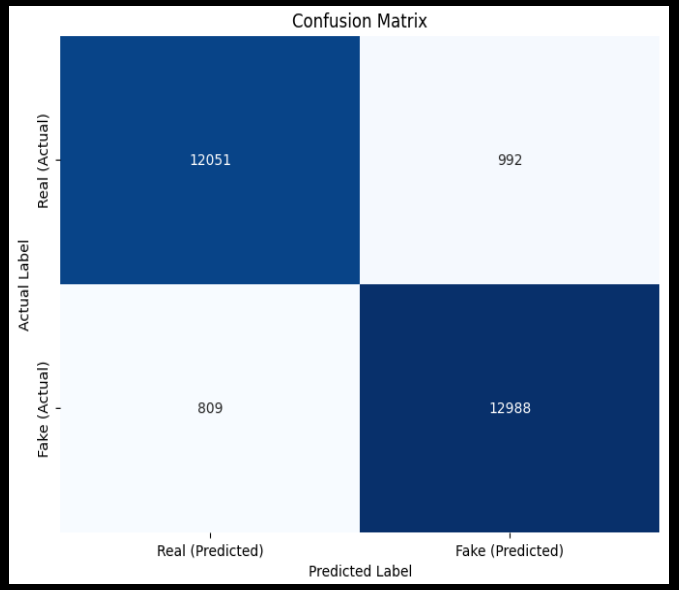


Follower Count Distribution

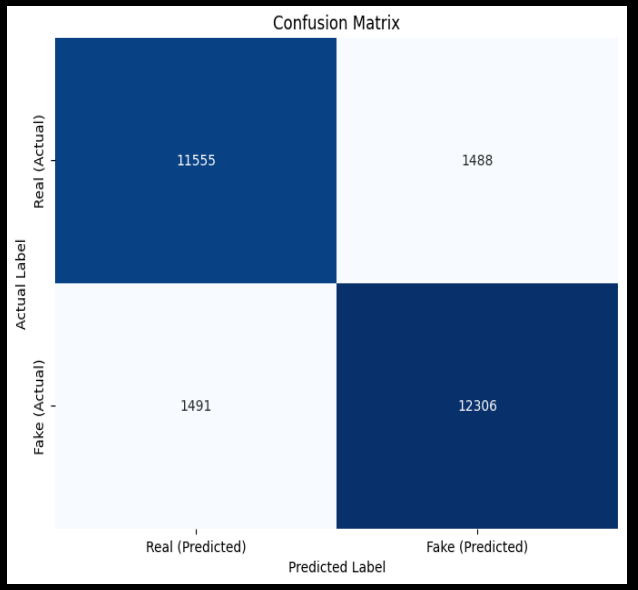
MODEL PERFORMANCE: CONFUSION METRICS



Logistic Regression



Random Forest



Decision Tree

EXPERIMENTAL RESULTS & ANALYSIS

Model/Metrics	Accuracy	Precision	Recall	F1-Score
Linear Regression	0.9427	0.9444	0.9442	0.9443
Random Forest	0.9329	0.9290	0.9414	0.9352
Decision Tree	0.889	0.8921	0.8919	0.8920