

DEEPMODEL DETECTION

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AGENDA



Introduction

Deepfake AI, short for “deep learning” and “fake,” is a technology that uses deep learning techniques and Artificial Intelligence (AI) to generate highly convincing fake or manipulated digital information, generally in the form of videos, images, or audio recordings.



Fake News Detection

Fake news detection is the process of identifying and filtering out false or misleading information, typically spread through online platforms, using various techniques from natural language processing (NLP) and machine learning (ML). The goal is to analyze content, sources, and dissemination patterns to determine the authenticity and credibility of the information.

Key techniques include:

1. Text Analysis: Examining the language, tone, and writing style to spot inconsistencies or red flags associated with fake news.

2. Source Verification: Checking the credibility of the source or author.

3. Fact-Checking: Comparing the content against reliable databases or fact-checking websites.

4. Machine Learning Models: Training models on labeled datasets to classify news as real or fake based on patterns.

Overall, the process aims to reduce the spread of misinformation by accurately identifying fake news before it reaches a larger audience.



LIBRARY USED

SKLEARN

SEABORN

NUMPY

PANDAS

RE

STRING

MATPLOTLIB

Importing Libraries

In [8]:

```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
from sklearn.metrics import classification_report
import re
import string
```

Loading Dataset

```
In [9]: data_fake=pd.read_csv("Fake.csv")  
data_true=pd.read_csv("True.csv")
```

```
In [10]: data_fake.head()
```

Out[10]:

	title	text	subject	date
0	Donald Trump Sends Out Embarrassing New Year's Card	Donald Trump just couldn't wish all Americans ...	News	December 31, 2017
1	Drunk Bragging Trump Staffer Started Russian ...	House Intelligence Committee Chairman Devin Nunes ...	News	December 31, 2017
2	Sheriff David Clarke Becomes An Internet Joke...	On Friday, it was revealed that former Milwaukee ...	News	December 30, 2017
3	Trump Is So Obsessed He Even Has Obama's Name...	On Christmas day, Donald Trump announced that ...	News	December 29, 2017
4	Pope Francis Just Called Out Donald Trump During His Visit To The U.S.	Pope Francis used his annual Christmas Day mes...	News	December 25, 2017

In [11]: `data_true.head()`

Out[11]:

	title	text	subject	date
0	As U.S. budget fight looms, Republicans flip t...	WASHINGTON (Reuters) - The head of a conservat...	politicsNews	December 31, 2017
1	U.S. military to accept transgender recruits o...	WASHINGTON (Reuters) - Transgender people will...	politicsNews	December 29, 2017
2	Senior U.S. Republican senator: 'Let Mr. Muell...	WASHINGTON (Reuters) - The special counsel inv...	politicsNews	December 31, 2017
3	FBI Russia probe helped by Australian diplomat...	WASHINGTON (Reuters) - Trump campaign adviser ...	politicsNews	December 30, 2017
4	Trump wants Postal Service to charge 'much mor...	SEATTLE/WASHINGTON (Reuters) - President Donald...	politicsNews	December 29, 2017

Insert a column and some manual testing

```
In [12]: data_fake["class"] = 0  
data_true["class"] = 1
```

```
In [13]: data_fake.shape, data_true.shape
```

```
Out[13]: ((23481, 5), (21417, 5))
```

```
In [14]: data_fake_manual_testing = data_fake.tail(10)  
for i in range(23480, 23470, -1):  
    data_fake.drop([i], axis=0, inplace=True)  
  
data_true_manual_testing = data_true.tail(10)  
for i in range(21416, 21406, -1):  
    data_true.drop([i], axis=0, inplace=True)
```

```
In [15]: data_fake.shape, data_true.shape
```

```
Out[15]: ((23471, 5), (21407, 5))
```

```
#Inserting the class column in both of the manual testing datasets  
data_fake_manual_testing['class']=0  
data_true_manual_testing['class']=1
```

In [17]: `data_fake_manual_testing.head(10)`

Out[17]:

		title		text	subject	date	class
23471	Seven Iranians freed in the prisoner swap have...	21st Century Wire says This week, the historic...	Middle-east	January 20, 2016	0		
23472	#Hashtag Hell & The Fake Left	By Dady Chery and Gilbert MercierAll writers ...	Middle-east	January 19, 2016	0		
23473	Astroturfing: Journalist Reveals Brainwashing ...	Vic Bishop Waking TimesOur reality is carefull...	Middle-east	January 19, 2016	0		
23474	The New American Century: An Era of Fraud	Paul Craig RobertsIn the last years of the 20t...	Middle-east	January 19, 2016	0		
23475	Hillary Clinton: 'Israel First' (and no peace ...	Robert Fantina CounterpunchAlthough the United...	Middle-east	January 18, 2016	0		
23476	McPain: John McCain Furious That Iran Treated ...	21st Century Wire says As 21WIRE reported earl...	Middle-east	January 16, 2016	0		
23477	JUSTICE? Yahoo Settles E-mail Privacy Class-ac...	21st Century Wire says It's a familiar theme. ...	Middle-east	January 16, 2016	0		
23478	Sunnistan: US and Allied 'Safe Zone' Plan to T...	Patrick Henningsen 21st Century WireRemember ...	Middle-east	January 15, 2016	0		
23479	How to Blow \$700 Million: Al Jazeera America F...	21st Century Wire says Al Jazeera America will...	Middle-east	January 14, 2016	0		
23480	10 U.S. Navy Sailors Held by Iranian Military ...	21st Century Wire says As 21WIRE predicted in ...	Middle-east	January 12, 2016	0		

In [18]: `data_true_manual_testing.head(10)`

Out[18]:

		title		text	subject	date	class
21407	Mata Pires, owner of embattled Brazil builder ...	SAO PAULO (Reuters) - Cesar Mata Pires, the ow...		worldnews	August 22, 2017		1
21408	U.S., North Korea clash at U.N. forum over nuc...	GENEVA (Reuters) - North Korea and the United ...		worldnews	August 22, 2017		1
21409	U.S., North Korea clash at U.N. arms forum on ...	GENEVA (Reuters) - North Korea and the United ...		worldnews	August 22, 2017		1
21410	Headless torso could belong to submarine journ...	COPENHAGEN (Reuters) - Danish police said on T...		worldnews	August 22, 2017		1
21411	North Korea shipments to Syria chemical arms a...	UNITED NATIONS (Reuters) - Two North Korean sh...		worldnews	August 21, 2017		1
21412	'Fully committed' NATO backs new U.S. approach...	BRUSSELS (Reuters) - NATO allies on Tuesday we...		worldnews	August 22, 2017		1
21413	LexisNexis withdrew two products from Chinese ...	LONDON (Reuters) - LexisNexis, a provider of l...		worldnews	August 22, 2017		1
21414	Minsk cultural hub becomes haven from authorities	MINSK (Reuters) - In the shadow of disused Sov...		worldnews	August 22, 2017		1
21415	Vatican upbeat on possibility of Pope Francis ...	MOSCOW (Reuters) - Vatican Secretary of State ...		worldnews	August 22, 2017		1
21416	Indonesia to buy \$1.14 billion worth of Russia...	JAKARTA (Reuters) - Indonesia will buy 11 Sukh...		worldnews	August 22, 2017		1

Concat the Dataset

```
In [19]: data_merge=pd.concat([data_fake,data_true],axis=0)  
data_merge.head(10)
```

Out[19]:

	title	text	subject	date	class
0	Donald Trump Sends Out Embarrassing New Year'...	Donald Trump just couldn t wish all Americans ...	News	December 31, 2017	0
1	Drunk Bragging Trump Staffer Started Russian ...	House Intelligence Committee Chairman Devin Nu...	News	December 31, 2017	0
2	Sheriff David Clarke Becomes An Internet Joke...	On Friday, it was revealed that former Milwauk...	News	December 30, 2017	0
3	Trump Is So Obsessed He Even Has Obama's Name...	On Christmas day, Donald Trump announced that ...	News	December 29, 2017	0
4	Pope Francis Just Called Out Donald Trump Dur...	Pope Francis used his annual Christmas Day mes...	News	December 25, 2017	0
5	Racist Alabama Cops Brutalize Black Boy While...	The number of cases of cops brutalizing and ki...	News	December 25, 2017	0
6	Fresh Off The Golf Course, Trump Lashes Out A...	Donald Trump spent a good portion of his day a...	News	December 23, 2017	0
7	Trump Said Some INSANELY Racist Stuff Inside ...	In the wake of yet another court decision that...	News	December 23, 2017	0
8	Former CIA Director Slams Trump Over UN Bully...	Many people have raised the alarm regarding th...	News	December 22, 2017	0
9	WATCH: Brand-New Pro-Trump Ad Features So Muc...	Just when you might have thought we d get a br...	News	December 21, 2017	0

Checking for Null Values

```
In [20]: data_merge.columns
```

```
Out[20]: Index(['title', 'text', 'subject', 'date', 'class'], dtype='object')
```

```
In [21]: # We will remove the columns that are required for us  
data = data_merge.drop(["title", "subject", "date"], axis = 1)
```

```
# Let's check if there are any null values in the dataset  
data.isnull().sum()
```

```
Out[21]: text      0  
         class     0  
        dtype: int64
```

Random Shuffling of the Rows

```
In [23]: # Here is the random shuffling of the rows in dataset  
data=data.sample(frac=1)  
data.head()
```

Out[23]:

		text	class
15069	BEIRUT (Reuters) - Lebanon s president has tol...		1
13920	Obama inspired hate...The Latest on a man char...		0
8370	The Republican Party has spent more than seven...		0
2442	Other nations are stepping up to play larger r...		0
8587	Some people in life still haven t grasped the ...		0

```
In [26]: data.reset_index(inplace=True)  
data.drop(['index'],axis=1,inplace=True)  
data.head()
```

Out[26]:

		text	class
0	BEIRUT (Reuters) - Lebanon s president has tol...		1
1	Obama inspired hate...The Latest on a man char...		0
2	The Republican Party has spent more than seven...		0
3	Other nations are stepping up to play larger r...		0

Function to Process the Text and Training

```
In [28]: def wordopt(t):
    tt = t.lower()
    t = re.sub('.*?\]', '', t)
    t = re.sub("\\"W", " ", t)
    t = re.sub('https?://\$+|www\.\$+', '', t)
    t = re.sub('<.*?>+', '', t)
    t = re.sub('[%s]' % re.escape(string.punctuation), '', t)
    t = re.sub('\n', ' ', t)
    t = re.sub('\w*\d\w*', '', t)
    return t
data["text"] = data["text"].apply(wordopt)
#Now we will define the dependent variable and independent variables
x = data["text"]
y = data["class"]

# Splitting the Dataset into a Training and Testing Set
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size=0.25)
```

Modelling

```
In [29]: from sklearn.feature_extraction.text import TfidfVectorizer  
  
vectorization = TfidfVectorizer()  
xv_train = vectorization.fit_transform(x_train)  
xv_test = vectorization.transform(x_test)
```

```
In [30]: from sklearn.linear_model import LogisticRegression  
LR = LogisticRegression()  
LR.fit(xv_train,y_train)
```

Out[30]:

▼ LogisticRegression

LogisticRegression()

```
In [31]: pred_lr=LR.predict(xv_test)  
LR.score(xv_test, y_test)
```

Out[31]: 0.989126559714795

Decision Tree Classifier

```
In [31]: from sklearn.tree import DecisionTreeClassifier  
DT=DecisionTreeClassifier()  
DT.fit(xv_train,y_train)
```

```
Out[31]: DecisionTreeClassifier  
DecisionTreeClassifier()
```

```
In [32]: pred_dt=DT.predict(xv_test)
```

```
In [33]: DT.score(xv_test,y_test)
```

```
Out[33]: 0.9958110516934047
```

```
In [34]: print(classification_report(y_test,pred_dt))
```

	precision	recall	f1-score	support
0	1.00	1.00	1.00	5844
1	1.00	1.00	1.00	5376
accuracy			1.00	11220
macro avg	1.00	1.00	1.00	11220
weighted avg	1.00	1.00	1.00	11220

Gradient Boosting Classifier

```
In [35]: from sklearn.ensemble import GradientBoostingClassifier  
GB=GradientBoostingClassifier(random_state=0)  
GB.fit(xv_train,y_train)
```

```
Out[35]: GradientBoostingClassifier  
GradientBoostingClassifier(random_state=0)
```

```
In [36]: pred_gb=GB.predict(xv_test)
```

```
In [37]: GB.score(xv_test,y_test)
```

```
Out[37]: 0.9957219251336898
```

```
In [38]: print(classification_report(y_test,pred_gb))
```

	precision	recall	f1-score	support
0	1.00	0.99	1.00	5844
1	0.99	1.00	1.00	5376
accuracy			1.00	11220
macro avg	1.00	1.00	1.00	11220
weighted avg	1.00	1.00	1.00	11220

Random Forest Classifier

```
In [39]: from sklearn.ensemble import RandomForestClassifier  
RF=RandomForestClassifier(random_state=0)  
RF.fit(xv_train,y_train)
```

```
Out[39]: RandomForestClassifier  
RandomForestClassifier(random_state=0)
```

```
In [40]: pred_rf=RF.predict(xv_test)
```

```
In [41]: RF.score(xv_test,y_test)
```

```
Out[41]: 0.9887700534759358
```

```
In [42]: print(classification_report(y_test,pred_rf))
```

	precision	recall	f1-score	support
0	0.99	0.99	0.99	5844
1	0.99	0.99	0.99	5376
accuracy			0.99	11220
macro avg	0.99	0.99	0.99	11220
weighted avg	0.99	0.99	0.99	11220

Model Testing

```
In [45]: def output_label(n):
    if n==0:
        return "FAKE NEWS"
    elif n==1:
        return "NOT A FAKE NEWS"
def manual_testing(news):
    testing_news={"text":[news]}
    new_def_test=pd.DataFrame(testing_news)
    new_def_test["text"]=new_def_test["text"].apply(word)
    new_x_test=new_def_test["text"]
    new_xv_test=vectorization.transform(new_x_test)
    pred_LR=LR.predict(new_xv_test)
    pred_DT=DT.predict(new_xv_test)
    pred_GBC=GB.predict(new_xv_test)
    pred_RFC=RFC.predict(new_xv_test)
    return print("\n\nLR Prediction: {} \nDT Prediction: {} \nGBC Prediction :{} \nRFC Prediction:{}".format(output_label(pred_L
```

OUTPUT

In [46]:

```
news = str(input())
manual_testing(news)
```

SAO PAULO (Reuters) - Cesar Mata Pires, the owner and co-founder of Brazilian engineering conglomerate OAS SA, one of the largest companies involved in Brazil's corruption scandal, died on Tuesday. He was 68. Mata Pires died of a heart attack while taking a morning walk in an upscale district of So Paulo, where OAS is based, a person with direct knowledge of the matter said. Efforts to contact his family were unsuccessful. OAS declined to comment. The son of a wealthy cattle rancher in the northeastern state of Bahia, Mata Pires links to politicians were central to the expansion of OAS, which became Brazil's No. 4 builder earlier this decade, people familiar with his career told Reuters last year. His big break came when he befriended Antonio Carlos Magalhães, a popular politician who was Bahia governor several times, and eventually married his daughter Tereza. Brazilians joked that OAS stood for Obraas Arranjoadas pelo Sócio Work Arranged by the Father-In-Law. Before the scandal, Forbes magazine estimated Mata Pires' fortune at \$1.6 billion. He dropped off the magazine's billionaire list in 2015, months after OAS sought bankruptcy protection after the Car Wash scandal. While Mata Pires was never accused of wrongdoing in the investigations, creditors demanded he and his family stay away from the builder's day-to-day operations, people directly involved in the negotiations told Reuters at the time. He is survived by his wife and his two sons.

LR Prediction: Not A Fake News

DT Prediction: Not A Fake News

GBC Prediction: Not A Fake News

RFC Prediction: Not A Fake News



The word deepfake has become a generic noun for the use of machine-learning algorithms and facial-mapping technology to digitally manipulate people's voices, bodies and faces. And the technology is increasingly so realistic that the deepfakes are almost impossible to detect.

Ben Sasse



THANK YOU