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Prediction of Future Terrorist Activities Using Machine Learning

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ABSTRACT: *The objective of this work is to predict the region and country of a terrorist attack using machine learning approaches. The work has been carried out upon the Global Terrorism Database (GTD),which is an open database containing list of terrorist activities from 1970 to 2017. Six machine learning algorithms have been applied on a selected set of features from the dataset to achieve anaccuracy of up to 82%. The results suggest that it is possible to train machine learning models inorder to predict the region and country of terrorist attack if certain parameters are known. It ispostulated that the work can be used for enhancing security against terrorist attacks in the world.*

Keywords—*Machine learning,Global Terrorism Data Base.*

I.INTRODUCTION

This paper is one of the first publications aimed at Terrorist attacks are spreading on a great pace across the world. As per the United Nations definition of Terrorism," any action with a political goal that is intended to cause death or serious bodily harm to civilians". In the last year, around 22 thousand events occurred globally, causing over 18 thousand casualties. The factors leading to terrorism change over time since they are dependent upon multiple political and social reasons. Apart from predicting reason behind the attack, identification of the responsible agencies is also difficult. There has been a dearth of the information regarding patterns of widespread terrorist behaviour. The existing analyses are either case studies or use of quantitative methods such as regression analysis. The former of these is specific to certain events, while the latter approach is restricted to interviews of civilians impacted by the attack. Most of these analyses depend on factors such as weapons used for the attacks and number of people harmed. Other type of analysis includes investigation of unusual patterns in individual behaviours or questioning detainees to acquire data pertaining to the attacks. The current research is focused on finding out the correlation between terrorism and its causal factors. Existing efforts have not been good enough for prediction. Machine learning approaches can ad in predicting the likelihood of a terrorist attack, given the required data. The results of this work can help the security agencies and policy makers to eradicate terrorism by taking relevant and effective

measures. Through analysis of events using GTD, six supervised machine learning models (Gaussian Naïve Bayes, Linear Discriminant Analysis, k-Nearest Neighbors, Support Vector Machines, Decision Tree, and Logistic Regression) were built and evaluated on their performances.

II. REVIEWOFLITERATURE

Predicting Terrorism with Machine Learning: Lessons from "Predicting Terrorism: A Machine Learning Approach" Basuchoudhary Atin, Bang James T, This paper highlights how machine learning can help explain terrorism. We note that even though machine learning has a reputation for black box prediction, in fact, it can provide deeply nuanced explanations of terrorism. Moreover, machine learningis not sensitive to the sometimes heroic statistical assumptions necessary when parametric econometrics is applied to the study of terrorism. This increases the reliability of explanations while adding contextual nuance that captures the flavor of individualized case analysis. We, therefore, suggest that it further expands the role of science in terrorism research.

There are many successful machine learning applications.Machinelearningapplicationsrangefromdata-mining

Major incidents that shaped aviation security his article is giving an overview about major incidents in civil aviation that have shaped the aviation security policies over the course of time. It begins with industry threats and security breaches (hijackings and terrorism), the counter measures and policy decisions are giving an example of changing the aviation security. The article continues with analysing the impact of 9/11, but also the current threats to civil aviation and the international efforts in combating them. The objective is to analyse the impact of the incidents on the evolution of aviation security and find out whether industry has been reactive or proactive to aviation threat mitigation. This article concludes that the security methods are reactively implemented, and a proactive attitude of the stakeholders has to maintain it course towards the aviation security, as we believe the aviation will have an increasingly part in the future of transportation. Analysis through the input of data (e.g. PDFs, Word Docs, textfiles).Itthen"enriches"thedatawithnaturallanguagecapabilities (e.g. sentiment analysis, named entity extraction,and concept tagging). Discovery service users, Phase 4, canintegrate with the cloud platform either through a portal or via APIs. The APIs enable uploading, downloading,configurationandqueryingofthe data[15].

III.RESULTS: ABSTRACT ANALYSIS

In existing system, we are analyzing the terrorist attacks but we don't know the how the attack will be happened where it will be happening and who will do etc. By using proposed system, we can identify which year, month attack will be happened and who will be attacked etc. We can analyze the better accuracy by using machine learning algorithms. It provides an approach to analyzing terrorism region and country with the machine learning techniques and terrorism specific knowledge to fetch conclusion about terrorist behavior patterns based on the success or failure. By increasing the accuracy, it is postulated that the work can be used for enhancing security against terrorist attacks in the world.

This helps the anti-terrorist organizations to reduce the list of possible suspects and help them act rapidly to find and catch the real suspect

IV.RESULTS: FULL TEXT ANALYSIS

This paper involved analyzing the design of few applications so as to make the application more users friendly. To do so, it was really important to keep the navigations from one screen to the other well-ordered and at the same time reducing the amount of typing the user needs to do. In order to make the application more accessible, the browser version had to be chosen so that it is compatible with most of the Browsers. For developing the application, the following are the Software Requirements:

1. Python
2. Anaconda3(Jupyter Notebook)

Data set

	eventid	iyear	imonth	iday	approxdate	extended	resolution	country	country_txt	region	...	addnotes	scite1	scite2	scite3	dbsource	INT_LOG
0	197000000001	1970	7	2	NaN	0	NaN	58	Dominican Republic	2	...	NaN	NaN	NaN	NaN	PGIS	0
1	197000000002	1970	8	0	NaN	0	NaN	130	Mexico	1	...	NaN	NaN	NaN	NaN	PGIS	0
2	197001000001	1970	1	0	NaN	0	NaN	160	Philippines	5	...	NaN	NaN	NaN	NaN	PGIS	-9
3	197001000002	1970	1	0	NaN	0	NaN	78	Greece	8	...	NaN	NaN	NaN	NaN	PGIS	-9
4	197001000003	1970	1	0	NaN	0	NaN	101	Japan	4	...	NaN	NaN	NaN	NaN	PGIS	-9

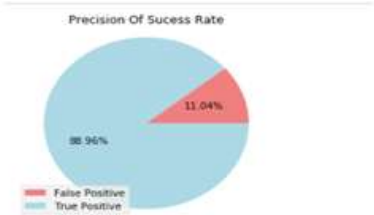
5 rows × 135 columns

	eventid	iyear	imonth	iday	extended	country	region	latitude	longitude	specificity
count	1.816910e+05	181691.000000	181691.000000	181691.000000	181691.000000	181691.000000	181691.000000	177135.000000	1.771340e+05	181685.000000
mean	2.002705e+11	2002.638997	6.467277	15.505644	0.045346	131.968501	7.160938	23.498343	4.586957e+02	1.451452
std	1.325957e+09	13.259430	3.388303	8.814045	0.208083	112.414535	2.933408	18.569242	2.047790e+05	0.805430
min	1.970000e+11	1970.000000	0.000000	0.000000	0.000000	4.000000	1.000000	-53.154613	-8.615596e+07	1.000000
25%	1.999021e+11	1991.000000	4.000000	8.000000	0.000000	78.000000	5.000000	11.510046	4.545640e+00	1.000000
50%	2.009022e+11	2009.000000	6.000000	15.000000	0.000000	98.000000	6.000000	31.467463	4.324651e+01	1.000000
75%	2.014081e+11	2014.000000	9.000000	23.000000	0.000000	160.000000	10.000000	34.685087	6.971032e+01	1.000000
max	2.017123e+11	2017.000000	12.000000	31.000000	1.000000	1004.000000	12.000000	74.633553	1.730967e+02	5.000000

8 rows × 77 columns

VI. RESULTS: OTHER ABSTRACT ANALYSIS

•Precision Success Rate



PRESICION SUCCESS RATE

- **Logistic Regression**

FIG.6.2 LOGIC REGRESSION

- **Error Weights**

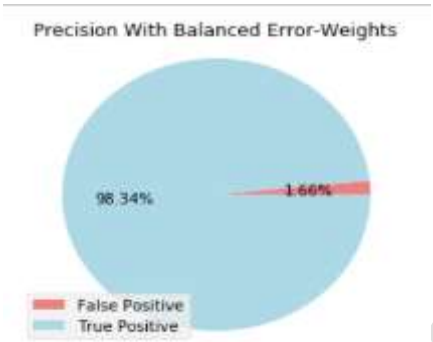


FIG.6.3 ERROR WEIGHTS

- **Manual Error Weights**

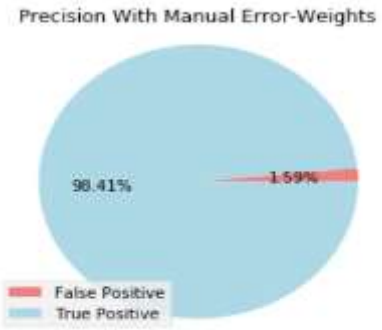


FIG.6.4 MANUAL ERROR WEIGHTS

- **Random Forest**

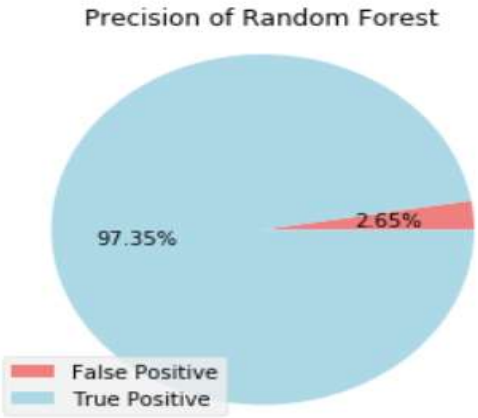


FIG.6.5 RANDOM FOREST

- **Decision tree Accuracy**

Decision Tree Accuracy 0.8895208042856094

DECISION TREE ACCURACY

- **KNN Accuracy**

FIG.6.6 KNN ACCURACY

- **LINEAR DISCRIMINANT ANALYSIS**

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Linear Discriminant Analysis Accuracy  0.8907132897923241
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FIG. 6.7 LINEAR DISCRIMINANT ANALYSIS

- **NAÏVE BAYES**

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Gaussian Naive Bayes Accuracy  0.187568797240772
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FIG.6.8NAÏVE BAYES

- **SVM ACCURACY**

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Support Vector Machine Accuracy  0.8897959932486974
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FIG.6.9SVM ACCURACY

VII.CONCLUSIONS AND FUTUREWORK

After training our models on the variable's month, Traget_type, attack type to predict the region of attack and country of attack it is estimated that Logistic regression, LDA, Naïve Bayes and SVM gives higher accuracy of 82 % in both the cases on predicting Region and country of terrorist attack. The results of the presented work can be used for enhancing defense against terrorist attacks in coming times.

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