

# Machine Learning: An Approach to Predict the Region and Country of Terrorist Attacks

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**Abstract** – Terrorism is defined as the use of intentional violence for political or religious purposes. Objective of this paper is to predict the region and country of terrorist attacks. It also finds the performance of machine learning algorithms to predict country and the region of terrorist attacks. Logistic Regression gives 82 % test accuracy on predicting country and predicting the region. This paper uses Global Terrorism Database (GTD) which is open source database including information on terrorist events around the world since 1970. This work can be used in future of policy makers to make policies and Defence system to keep track on and predicting terrorist activities.

**Key Words:** machine learning, terrorism prediction, global terrorism database, model training, accuracy, region, violence, etc.

## 1. INTRODUCTION

Terrorism is defined as the use of intentional violence for political or religious purposes. It is used in this regard primarily to refer to violence during peacetime or in context of the war against non-combats.

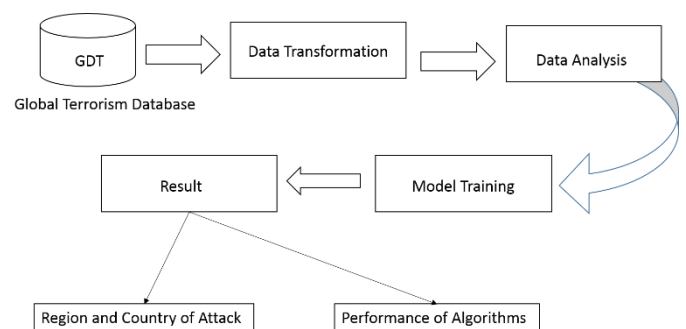
India continues to face a number of terrorist attacks. Terrorist attacks on Taj Hotel Mumbai, attack of Pulwama and the attack of Uri really stayed with us.

Terrorism is calculated use of violence to create general climate of fear in population and thereby to bring about a particular political objective. Terrorism is practiced by political organizations with both rightist and leftist objective, by nationalist and religious group, by revolutionaries and even by state institutions such as army, intelligence service and police.

In recent years, the number of terrorist attacks reached a low in 2012 with 6771 attacks globally. In 2014 the number of attacks had more than doubled to 13,463 attacks. The majority of terrorism acts have been located in Middle Eastern countries such as Afghanistan and Syria which suffered 1,294 and 871 attacks respectively. Afghanistan is at number 1 in Global Terrorism Index. Globally over 26,000 peoples died in terrorist attacks in 2017.

Machine Learning is the study of computer algorithms that improve automatically through experience. It is seen as a subset of Artificial Intelligence. In this work six machine learning algorithm are used to predict country and the region of terrorist attacks. These algorithms are Gaussian Naïve Bayes, Linear Discriminant, K-Nearest Neighbors, Support Vector Machine, Decision Tree and Logistic Regression. We have trained models using this algorithms and their performance is calculated.

Fig -1: System Architecture



GTD called as Global Terrorism Database is the open source database which stores information about terrorist attacks since 1970. It includes data of international terrorist attacks, domestic violence and also transnational terrorist attacks. First we performed data transformation on GTD. To gain information from data we performed data analysis on GTD. Then using six machine learning algorithms (Gaussian Naïve Bayes, Linear Discriminant Analysis, K-Nearest Neighbors, Support Vector Machine, Decision Tree, Logistic Regression) we have done model training. In data analysis we analyzed yearly attacks, nation wise attacks, regions attacked, groups involved in attacks and types of attacks.

## 2. Literature Survey

In 2019 Mohammed AL faith, Chunlin Li, Naila Elhag Sadalla [1] done study on Prediction of groups of terrorism responsible for terrorism attack using tree based models. They used Random Forest technique and tree based models to predict perpetrators.

In 2018 Atin Basuchoudhary, James T. Bang done predictive analysis of terrorism using machine learning approaches.

They have highlighted thing that how machine learning helps to predict terrorist activities. [2]

Timothy Mathews and Shane Sabders in 2018 done strategic and experimental analysis of conflict and terrorism. They have applied tools of game theory and used experimental economics to analyze conflict and terrorism. Ultimately they have tried to find out root cause of terrorism and conflict. [3]

Dr. Lan Raverscoft in 2019 used data set on causality rates which is readily available data set. Dr. Lan Raverscoft operationalized terrorist efficacy as causality rates per attack. They have considered religious connection for terrorist attacks. [4]

Jianqiang Li, Shenhe Zhao in 2017 done terrorist activities and events prediction based on revealing data. They found classification precision of 78.41 %. They have applied machine learning based on data mining. They found that when features are more than 7 the precision of Naïve Bayes algorithm is constantly decreases. [5]

In 2019 S. Kalaiarasi, Ankit Mehata predicted responsible perpetrator with precision off eight out of ten. They have considered social media activities and threats. They have used Global Terrorism Database (GDT) for the same. [6].

In 2018 Oludare Issac Abiodun and Aman Jantan done research on detecting terrorist activities using people’s profiles. They have applied big data approach for this work. They have measured individual person’s level of involvement in terrorism crime. They have done individual person’s profile analysis. They have achieved 26.485 % prediction on overall test. [7]

### 3. LIVE SURVEY

Terrorism is threat of violence that creates fear in a population. It is also important to understand that all violent acts are not terrorist acts.

On 14 February 2019 one of the deadliest terrorist attacks on brave security forces in Pulwama, Jammu and Kashmir shocked the nation. In the attack at least 40 CRPF personnel killed. Explosive-filled vehicle was rammed by Jaish-e-Mohammed (JeM) terrorist on a bus ferrying CRPF jawans. [8]

On 18 September 2016, the worst attack on Army, heavily armed militants suspected to be from Pakistan based JeM stormed an army base in Uri in Kashmir where 17 jawans were killed. The army base was located barely a few

kilometers from the Line OF Control (LOC) and some 70 km from Srinagar and was attacked by four terrorist. [9]

“Terrorist of various groups as well as anti-social elements might be planning terror attacks in Delhi”, says communication issued by the intelligence agencies. [10]

For India terrorism is no new entity and the nation is familiar with violent activities throughout. It is well established that the terrorists, along with those who inspire them, represent a major transnational challenge, with the detection and disruption of such groups always being priority. [11]

### 4. RESULT

**Table -1** Predicting Region

Sr No.	Model Trained		
	Model Name	Train Accuracy %	Test Accuracy %
1.	Logistic Regression	67	82
2.	Decision Tree	97	73
3.	K-Nearest Neighbors	76	73
4.	Linear Discriminant Analysis	70	82
5.	Naïve Bayes	79	82

**Table -2** Predicting Country

Sr No.	Model Trained		
	Model Name	Train Accuracy %	Test Accuracy %
1.	Logistic Regression	67	82
2.	Decision Tree	97	73
3.	K-Nearest Neighbors	73	73

4.	Linear Discriminant Analysis	70	82
5.	Naïve Bayes	97	82

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#### 4. CONCLUSIONS

From the above results it is concluded that Logistic Regression and Linear Discriminant Analysis gives 82 % test accuracy in predicting region and the country of terrorist attacks. This result can be used in predicting region and the country of terrorist attacks. This result can be used by security agencies, policy makers and the Defence system to predict terrorist activities.

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