WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Implementation of Women Safety in Indian Cities Using SVM on Facebook and Instagram

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ABSTRACT

In addition to raising awareness, social media platforms such as Twitter, Facebook, and Instagram provide women with a powerful tool to share their personal experiences of harassment, report incidents in real-time, and seek help from the public and authorities. Hashtags related to women's safety, such as #MeToo and #TimesUp, have gained global attention and fostered a sense of solidarity among women across different cultures and regions. In Indian cities, these platforms have become vital in initiating conversations around gender-based violence, breaking taboos, and challenging societal norms that perpetuate harassment. Social media also plays a key role in mobilizing communities, allowing individuals to come together and voice their concerns. This collective power can pressure policymakers, law enforcement agencies, and organizations to take more decisive actions towards creating safer public spaces.

Keywords: Harassment reporting, online advocacy, safety measures, database, efficiency and accuracy.

I. Introduction

In today's digital era, social media platforms play a crucial role in communication, but they also pose significant risks, especially for women. The rise of online harassment, vulgar language, and cyberbullying creates an unsafe environment that can have real-world implications. Additionally, physical safety in cities remains a major concern, with many individuals unaware of the safety conditions of different locations.

Women's safety has become a pressing concern in today's society, with increasing incidents of harassment, violence, and online abuse. The rise of social media has further exacerbated the problem, with women facing online threats, cyberbullying, and digital harassment. According to recent statistics, one in five women face online harassment, and two-thirds of women experience some form of violence or harassment in their lifetime. These alarming numbers underscore the need for innovative solutions to address the complex issue of women's safety.

In recent years, machine learning and artificial intelligence have emerged as powerful tools for analyzing and addressing social issues. By leveraging large datasets and advanced al- gorithms, machine learning models can identify patterns and trends that may not be apparent through traditional analysis. In the context of women's safety, machine learning can be used to analyze social media data, identify instances of online harassment, and predict the safety of a particular area.

This project aims to develop a machine learning-based system that utilizes Support Vector Machines (SVM) to analyze and predict the safety of a particular area for women. Our system will leverage social media data, including text, images, and videos, to identify and classify instances of online harassment and abuse. By applying natural language processing (NLP) and computer vision techniques, our system will be able to detect and analyze the sentiment and content of online posts, comments, and messages. This information will be used to generate a safety score for a particular area, indicating the level of safety for women.

The primary objectives of our project are:

1. To develop a machine learning-based system: that can accurately predict the safety of a particular area for women. 2. To analyze and classify social media data: to identify instances of online harassment and abuse. 3. To provide a user-friendly interface: for women to report incidents of harassment and abuse. 4. To generate a safety score: for a particular area, indicating the level of safety for women.

By utilizing machine learning and social media analytics, our project aims to create a safer and more supportive en- vironment for women, both online and offline. Our system has the potential to empower women to make informed decisions about their safety, and to provide law enforcement agencies and policymakers with valuable insights to inform their decision-making.

In this project, we will explore the application of machine learning techniques to analyze social media data and predict the safety of a particular area for women. We will also discuss the potential benefits and limitations of our approach, and pro- vide recommendations for future research and development.

2. PROBLEM STATEMENT

A. Identifying and Predicting Violence Against Women using Machine Learning.

The problem of violence against women remains perva- sive and continues to have severe consequences on women's physical and mental health worldwide. Traditional methods for identifying and addressing such violence are often inadequate, primarily due to social stigma, cultural taboos, and a lack of awareness. Many women, particularly in rural or under- developed regions, face barriers in reporting abuse due to fear of retaliation, shame, or disbelief. Healthcare professionals and social workers may not always be equipped with the necessary tools or training to recognize psychological trauma, such as PTSD, or behavioral indicators of intimate partner violence (IPV). This lack of awareness contributes to delayed or improper interventions. Additionally, existing systems for detecting and addressing violence against women tend to rely on subjective self-reporting, manual data collection, and interviews, which are prone to bias and human error. These methods also fail to adequately capture the emotional and psychological impacts of violence, leaving critical aspects of a woman's well-being unaddressed. As a result, there is a need for a more comprehensive, technology-based solution that can accurately identify women affected by violence, taking into account both their physical and psychological conditions. This approach should help healthcare providers and social workers intervene more effectively by delivering timely, tailored support.

3. OBJECTIVES

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A. ABBREVIATIONS AND ACRONYMS

The project "Women Safety using SVM" employs various technologies and techniques, including Support Vector Ma- chine (SVM), Application Programming Interface (API), User Interface (UI), and User Experience (UX) design. Additionally, Natural Language Processing (NLP), Machine Learning (ML), and Artificial Intelligence (AI) are utilized to analyze and classify social media data. Other relevant acronyms include Internet of Things (IoT), Global Positioning System (GPS), and Geographic Information System (GIS), which may be used to track and map incidents of harassment and abuse.

4. SYSTEM DESIGN AND BLOCK DIAGRAM

A. PROPOSED SYSTEM

Women's safety in urban spaces remains a significant concern, with many facing daily threats of harassment and violence while commuting or engaging in routine activities. Despite laws and initiatives aimed at safeguarding women, the implementation and enforcement of these laws often fall short, leaving many women vulnerable. This has led to a pervasive culture of fear, where women are hesitant to venture out alone, fearing for their safety. The fear of harassment, whether verbal or physical, creates a barrier to women's participation in public life, limiting their freedom and opportunities.

The concept of a "safe city" goes beyond merely providing physical security. It encompasses creating an environment where women feel empowered to move freely, interact without fear, and live their lives without the constant threat of violence or exploitation. Educating society, enforcing stringent laws, and leveraging technological tools for real-time reporting can contribute to a safer environment. Social media platforms have also emerged as powerful tools in raising awareness, providing a platform for women to share their experiences and encourage collective action.

However, creating a safe city for women requires a multi- faceted approach that involves governments, civil society, and individuals working together to promote women's safety and empowerment. This includes implementing policies and programs that address the root causes of violence against women, providing support services for survivors, and promot- ing community engagement and participation.

Challenges:

1. Limited access to technology in rural areas. 2. Social media misuse and potential backlash. 3. Resistance to societal change and awareness. 4. Ineffective law enforcement and lack of accountability. 5. Implementation delays in public safety projects. 6. Privacy concerns with surveillance and reporting tools. 7. Potential for victim-blaming in online platforms.

B. BLOCK DIAGRAM

A block diagram is a graphical representation of a system or process that shows relationships between components or steps. It uses blocks/boxes and arrows to illustrate complex systems, identify relationships, and analyze/optimize performance.

5. DATA SET COLLECTION

4. K-NN

Fig. 1. work flow

Data set collection refers to the process of gathering and compiling data from various sources into a single, organized dataset. This can include:

- Collecting data from social media platforms.
- Scraping data from websites.
- Conducting surveys or interviews.
- Gathering data from sensors or IoT devices.
- Using existing datasets from public or private sources.

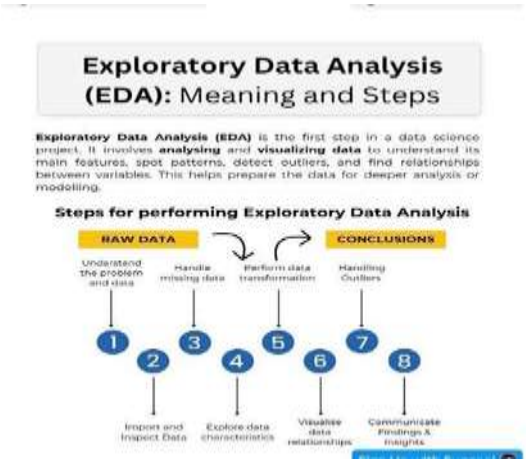
1. DATA PROCESSING

Data processing refers to the steps taken to clean, transform, and prepare data for analysis or modeling. This includes:

- Cleaning: Removing errors and inconsistencies.
- Transforming: Converting data into a usable format.
- Filtering: Selecting relevant data.
- Sorting: Organizing data for analysis.

2. EDA

Exploratory Data Analysis (EDA) is the process of visually and statistically examining data to understand its underlying patterns, relationships, and structure. EDA involves using various techniques, such as plots, charts, and summary statistics, to identify trends, outliers, and correlations within the data. This helps to gain insights, formulate hypotheses, and inform further analysis or modeling.



K-Nearest Neighbors (KNN) is a supervised machine learn- ing algorithm that classifies new data points based on their similarity to existing data points. It works by:

1. Finding the K most similar data points to a new data point.
2. Assigning the new data point the class label that is most common among its K nearest neighbors.

The ”K” in K-NN refers to the number of nearest neighbors to consider when making a prediction. For instance, if K is set to 3, the algorithm looks at the three closest data points to the new instance and assigns the most common class among those neighbors to the new instance. In the case of text classification in this project, K-NN can be used to classify social media posts based on features such as word frequency or sentiment analysis results. The posts are represented in a high- dimensional space where each dimension corresponds to a specific word or feature, and K-NN determines the class by calculating the distance (using metrics like Euclidean or cosine distance) between the test point and the training points. The key advantages of K-NN include its simplicity, ease of implementation, and ability to handle both numeric and categorical data. However, it has some limitations, especially when dealing with high-dimensional data, such as social media text. The algorithm's performance can degrade if the dataset is too large or noisy, and its computational efficiency may be a concern for real-time applications, as it requires comparing the new data point with all the training samples. In this project, K-NN can serve as a baseline model for classifying social media posts. However, more sophisticated models such as deep learning methods or ensemble techniques may be used to improve performance, especially when working with large, unstructured datasets like social media posts. Despite these limitations, K-NN provides an intuitive and effective approach for analyzing text data and can be used to support safety- related interventions by identifying relevant posts in real time.KNN is commonly used for classification and regression tasks.

5. NLP

Natural Language Processing (NLP) is a branch of artificial intelligence that deals with the interaction between computers and humans in natural language. It involves the processing, analysis, and generation of natural language data, such as text or speech, to extract meaning and perform tasks like:

- Sentiment analysis
- Text classification
- Language translation
- Speech recognition
- Text summarization

6. MODEL IMPLEMENTATION

Model implementation is the process of putting a machine learning model into action, using the selected algorithm and trained parameters. This involves writing code to integrate the model into a larger system, deploying the model in a production environment, and integrating it with other expected and provides accurate results in real-world scenarios.

7. WEB API

A Web API (Application Programming Interface) is a set of defined rules that enable different applications, systems, or services to communicate with each other over the internet. It allows for the exchange of data, services, or functionality between systems, enabling features like data retrieval, updates,and manipulation.

8. INPUT PARAMETER

The input parameters for this project are crucial to ensure the accuracy and effectiveness of the women's safety system, particularly when analyzing social media content or interac- tions for potential harassment. These parameters primarily in- clude textual data, images, and metadata collected from social media platforms like Twitter, Facebook, and Instagram. The primary input for analysis is the textual content of posts, com- ments, and hashtags related to women's safety, harassment, or violence. Users can submit these texts either directly or by integrating their social media accounts to automatically

gather relevant posts. Additionally, images accompanying these posts (such as photos shared with tweets or Facebook posts) may also be used as inputs to identify potential signs of abuse or harassment. Facial recognition, image content, and context are analyzed through machine learning models, which classify the image based on predefined categories (such as signs of distress or victimization).

9. OUTPUT

10 CONCLUSION

The increasing prevalence of harassment and violence against women in public spaces across Indian cities has prompted the need for more effective solutions. In this context, leveraging machine learning and social media platforms, like Twitter, to monitor and address women's safety concerns offers a promising avenue for improving public safety. The use of Natural Language Processing (NLP) and sentiment analysis to classify tweets based on their emotional tone can provide valuable insights into the public's perception of safety, while also identifying emerging issues and trends. Integrating real-time data sources such as surveillance footage, emergency alerts, and crowd-sourced reports further strengthens the system, enabling authorities to act swiftly when threats are detected. Combining this approach with the use of machine learning algorithms like Support Vector Machines (SVM) and K-NN for analyzing large volumes of data makes the system more efficient in categorizing and understanding diverse threats. Collaboration with local law enforcement and women's safety organizations amplifies the system's reach and responsiveness, creating a support network that responds quickly to safety concerns. Furthermore, the continuous monitoring of social media platforms allows for a proactive approach in addressing harassment and violence, as well as spreading awareness. The data-driven insights generated through these tools can guide policymakers and local authorities in crafting targeted inter- ventions to enhance public safety. As technology evolves, this approach will become an increasingly vital tool for improving women's safety, ensuring that women in Indian cities can navigate public spaces with greater security and confidence.

References

[1] G. Ali, A. Ali, F. Ali, U. Draz, F. Majeed, S. Yasin, T. Ali, and N. Haider, "Artificial neural network based ensemble approach for multicultural.

[2] G. Ali, A. Ali, F. Ali, U. Draz, F. Majeed, S. Yasin, T. Ali, and N. Haider, "Artificial neural network based ensemble approach for multicultural.

[3] H.-S. Cha, S.-J. Choi, and C.-H. Im, "Real-time recognition of fa- cial expressions using facial electromyograms recorded around the eyes for social virtual reality applications," IEEE Access, vol. 8, pp. 62065–62075, 2020.

[4] COVID-19 and Violence Against Women: What The Health Sec- tor/System Can Do, 7 April 2020, World Health Organization, Geneva, Switzerland, 2020.

[5] A. Walia. (2017). Annotated Corpus for Named Entity Recognition. Accessed: Jan. 10, 2020. [Online]. Available: https://www.kaggle.com/abhinavwalia95/entity-annotated-corpus.

[6] S. Stake, S. Ahmed, W. Tol, S. Ahmed, N. Begum, R. Khanam, M. Harrison, and A. H. Baqui, "Prevalence, associated factors, and disclo- sure of intimate partner violence among mothers in rural bangladesh," J. Health, Population Nutrition, vol. 39, no. 1, pp. 1–11, Dec. 2020.

[7] Word2vec. Accessed: Jan. 10, 2020. [Online]. Available: https://code.google.com/archive/p/word2vec/

[8] A. R. Javed and Z. Jalil, "Byte-level object identification for forensic investigation of digital images," in Proc. Int. Conf. Cyber Warfare Secur. (ICCWS), Oct. 2020, pp. 1–4.

[9] W. Ahmed, F. Shahzad, A. R. Javed, F. Iqbal, and L. Ali, "WhatsApp network forensics: Discovering the IP addresses of suspects," in Proc. 11th IFIP Int. Conf. New Technol., Mobility Secur. (NTMS), Apr. 2021,pp. 1–7.

[10] A. Abbasi, A. R. Javed, C. Chakraborty, J. Nebhen, W. Zehra, and Z. Jalil, "ElStream: An ensemble learning approach for concept drift detection in dynamic social big data stream learning," IEEE Access, vol. 9, pp. 66408– 66419, 2021.

[11] A. Jaiswal, A. Krishnama Raju, and S. Deb, "Facial emotion detection using deep learning," in Proc. Int. Conf. for Emerg. Technol. (INCET), Jun. 2020, pp. 1–5.

[12] P. Babajee, G. Suddul, S. Armoogum, and R. Foogooa, "Identifying human emotions from facial expressions with deep learning," in Proc. Zooming Innov. Consum. Technol. Conf. (ZINC), May 2020, pp. 36–39.