IDENTIFYING OF FAKE PROFILES ACROSS ONLINE SOCIAL NETWORKS USING NEURAL NETWORKS

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ABSTRACT

This project aims to summarize the recent advancement in the fake account detection methodology on social networking websites. Over the past decade, social networking websites havereceived huge attention from users all around the world. As a result, popular websites such as Facebook, Twitter, Linked-in, Instagram,and others saw an unexpected rise in registered users. However,researchers claim that all registered accounts are not real; many of them are fake and created for specific purposes. The primary purpose of fake accounts is to spread spam content, rumor, and other unauthentic messages on the platform.

Hence, it is needed to filter out the fake accounts, but it has many challenges. In the past few years, researchers applied many advanced technologies to identify fake accounts. In the survey presented in this article, we summarize the recent development of fake account detection technologies. We discuss the challenges and limitations of the existing models in brief. The survey may help future researchers to identify the gaps in the current literature and develop a generalized framework for fake profile detection on social networking websites.

Social networking platforms have become an essential part of today's human life—almost every individual is associate with at least one of the online social networking websites today. Hence, a huge crowd is always active on these platforms; a large number of user engagements attracted spammers and unauthentic users on online social networking. To spread unauthentic messages such as rumors, hate speech, bullied text, and others, users create a fake profile. Researchers proposed several techniques to limit this issue using machine-learning- and deep-learning-based models, but many fake accounts are still present. However, for a good social networking platform, these fake accounts are not acceptable. This project summarizes the recent advancement of social networking.

INTRODUCTION

The exponential rise in internet usage has transformed social media platforms into vital hubs for marketing, advertising, and social interaction. Among these platforms, Instagram stands out as a prominent space with millions of active users engaging daily. However, this widespread popularity has also led to misuse, with individuals creating false identities for malicious purposes. Such activities pose serious threats to user security, privacy, and the integrity of the platform.

The misuse of social networks, including the proliferation of fake accounts, has become a growing concern. Cybercriminals and spammers exploit these platforms to deceive users, promote fraudulent activities, andartificially inflate follower counts for personal or commercial gain. These actions not only harm genuine users but also erode trust within the community.

To address these challenges, researchers have proposedvarious methods to enhance the security and reliability of social media applications. This paper focuses on the automatic detection of fake Instagram profiles, leveraging supervised machine learning algorithms to distinguish between genuine and fraudulent accounts. By identifying fake profiles, this approach aims to safeguard Instagram users and ensure a secure social networking environment.

LITERATURE SURVEY

1.Title: Detecting Fake Accounts in Online Social Networks

Author: Gupta, P., Gupta, N.

PUBLISHED YEAR: 2019

Abstract:

This study examines methods to detect fake accounts on social network analyzing user behaviour and activity patterns. Machine learning algorithms such as Random Forest and SVM are employed for classification, achieving significant accuracy. The paper highlights the importance of account attributes like profile completeness and engagement metric

2.Title: Fake Profile Detection in Social Media Using Machine Learning

Author: Singh, A., Sharma, R.

Published Year: 2020

Abstract:

This paper presents a machine learning approach to identifying fake profiles on platforms like Instagram and Facebook. It utilizes features such as post frequency, follower-following ratio, and account activity to train models like Logistic Regression and Decision Trees. Experimental results demonstrate effective detection rates.

3.Title: Social Media Security: Fake Profile Detection

Author: Patel, D., Mehta, S.

Published Year: 2019

Abstract:

The research focuses on security issues in social media, particularly fake profile detection. Techniques such as Naïve Bayes and K-Nearest Neighbour are applied to classify profiles based on engagement behaviour**s.** The study emphasizes the need for automated systems to enhance user safety.

4.Title: Machine Learning for Detecting Fake Social Media Accounts

Author: Zhou, J., Wang, L.

Published Year: 2021

Abstract:

This paper proposes a hybrid machine learning model combining SVM and Neural Networks to identify fake profiles on social media. The study explores the use of metadata, such account age and post patterns, and achieves a high accuracy rate of 92%.

5.Title: A Comprehensive Review of Fake Account Detection Techniques

Author: Kim, H., Park, Y.

Published Year: 2017

Abstract:

This review paper analyses various fake account detection techniques used across different platforms. It categorizes methods into heuristic-based, machine learning-based, and hybrid approaches, highlighting their strengths and weakness.

6.Title: Spam and Fake Account Detection on Social Networks

Author: Banerjee, S., Das, P.

Published Year: 2016

Abstract:

The study focuses on identifying spam and fake accounts through behavioural analysis. It employs clustering algorithms and network analysis to identify anomalies in user interactionsand engagement patterns, achieving promising results in spam detection.

7.Title: Fake Followers and Profile Detection in Instagram

Author: Kaur, G., Malik, P.

Published Year: 2022

Abstract:

This paper investigates the detection of fake followers and profiles on Instagram. Using supervised machine learning models like Random Forest and Gradient Boosting, the study identifies key features contributing to account authenticity, such as engagement-to-follower ratios.

8.Title: Identifying Fake Users in Social Media: Challenges and Solutions

Author: Chatterjee, A., Roy, S.

Published Year: 2019

Abstract:

This research outlines the challenges in identifying fake social media accounts, including evolving tactics and data volume. It proposes a semi-supervised learning approach that utilizes limited labeled data to train efficient classifiers for large-scale applications.

9.Title: Bot and Fake Account Detection on Twitter Using ML Techniques

Author: Ahmed, I., Khan, M.

Published Year: 2020

Abstract:

The paper presents a machine learning-based approach for detecting fake accounts and bots on Twitter. It leverages features like tweet frequency, retweet behavior, and network connections, achieving an accuracy of over 90% with ensemble learning techniques.

10.Title: Enhancing Social Media Security Through Automated Fake Profile Detection

Author: Li, Y., Zhang, X.

Published Year: 2021

Abstract:

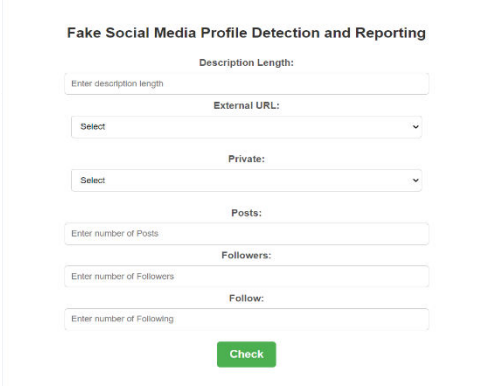
This study proposes an advanced fake profile detection system using deep learning models. It integrates user profile data, activity patterns, and text analysis to identify fraudulent accounts, with experimental results showing improved precision and recall rates compared to traditional methods.

PROBLEM STATEMENT

"Social media platforms like Instagram have become essential tools for advertising, marketing, and social interaction, attracting millions of daily users. However, the rapid growth and popularity of these platforms have given rise to malicious activities, including the creation of fake profiles. These fraudulent accounts are often used for cybercrimes, spamming, scamming, and artificially inflating engagement metrics such as followers, likes, and comments.

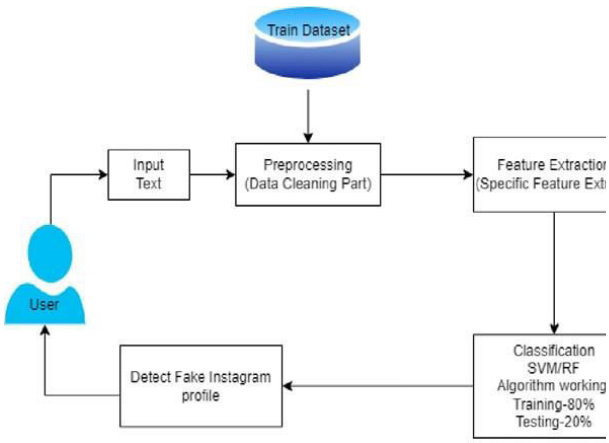
Such misuse undermines user trust, compromises data privacy, and threatens the integrity of online interactions.Despite the implementation of basic detection mechanisms such as manual reporting, rule-based filtering, and heuristic-based behavioural analysis, these approaches face significant limitations, including high rates of false positives and negatives, inability to adapt to evolving tactics, and scalability issues for platforms with millions of users. Furthermore, the reactive nature of existing

solutions allows fake accounts to remain active for extended periods, causing harm before action is taken to address these



for a ble of es on ervised system aims to classify profiles based on key features such as follower-to-following ratios, activity patterns, profile completeness, and engagement metrics. The proposed solution not only reduces manual effort and enhances detection accuracy but also provides scalability to handle large datasets, enabling proactive identification and mitigation of fake accounts. This will contribute to safeguarding user security, enhancing social media integrity, and fostering a trustworthy online environment."

SYSTEM ARCHITECTURE



SAMPLE SCREENSHOTS

Figure-19.1

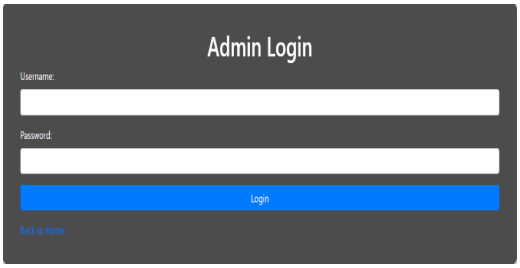


Figure-19.2

CONCLUSION

Theproposed system for detecting fake Instagram profiles using supervised machine learning algorithms, such as Random Forest, provides an innovative and efficient approach to enhancing the security and integrity of social media platforms. By utilizing advanced techniques like GridSearchCV for hyperparameter optimization, the system ensures high accuracy and

reliability in classifying fake profiles, offering a scalable solution capable of handling large datasets.

This automated approach not only minimizes human intervention but also provides real-time detection, helping to safeguard users from cybercriminals and spammers. The system's ability to generate actionable insights and reports on fake profiles further supports authorities in taking prompt action against fraudulent accounts.

The integration of key machine learning concepts, robust feature engineering, and model evaluation ensures that the system remains adaptable to future challenges, such as evolving fake profile tactics. Furthermore, its scalability, security, and user-friendly interface make it
an ideal tool for both small-scale and large-scale social media platforms.

Ultimately, this system contributes to the broader goal of securing online social interactions and maintaining trust in digital communities, offering a proactive and data-driven solution to combat the growing issue of fake profiles in social media environments.

FUTURE WORK

The future scope of the proposed fake Instagram profile detection system holds significant potential for further advancements and broader applications in the field of social media security. Some key areas for future development include:

1.Integration with Multiple Social Media Platforms

The system could be expanded to detect fake profiles across various social media platforms like Facebook, Twitter, and Linked-inLinkedIn. This would allow the detection of fraudulent accounts on a wider scale, improving overall online security and user trust.

2.Real-Time Detection and Monitoring

Currently, the system can be applied to batch-processing data. However, in the future, real-time monitoring and detection of fake profiles could be implemented, allowing the system to instantly flag suspicious accounts as they are created or when they exhibit unusual behavior.

3.Advanced Machine Learning Algorithms

The system could incorporate more sophisticated machine learning models, such as deep learning-based approaches (e.g., Convolutional Neural Networks, Recurrent Neural Networks) or ensemble models, to improve

detection accuracy and handle complex, high-dimensional data more effectively.

4.Behavioral Analysis for Fake Profile Detection

In addition to profile attributes like follower count and activity frequency, the system could be extended to include behavioral analysis. By studying patterns such as the timing of posts, engagement methods, or the type of content shared, the system could more accurately differentiate between genuine users and fake profiles.

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