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Using Twitter to Predict Personality

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ABSTRACT

Social media provides a place where people exhibit them self to the world, providing intimate facts and insights about their life. We are begun to comprehend how some of this data may be exploited to enhance users' interactions with interfaces and with each other. We are interested in the characteristics of users in this study. Personality has been found to be significant to a variety of interactions, including job happiness, professional and romantic relationship success, and interface preference. Until now, users needed to take a personality assessment to accurately assess their personalities. [2] This rendered application of psychological across many social media venues impractical. In this research, we offer a method for accurately predicting the personality of a Twitter user based on their public profile information. We will present the acquired data, our analytical techniques, as well as the machine learning approaches that permit us to accurately predict personality. The ramifications for social networking development, interface design, and other disciplines are then discussed [4].

Index Terms— social networking sites, and personalities.

I. INTRODUCTION

In the last ten years, the popularity of online social networking has skyrocketed. According to a research of social media websites in January 2005, there were around 115 million members on the web at the time. After a little more than five years, Twitter has grown to over 200 million users. When building a social networking page, people disclose a lot about themselves by the content they post and the language they use. Much of a user's character may be gleaned from their profile's self-description, status updates, photographs, and list of interests.

Researchers in psychology have been working for decades on a systematic understanding of personality. Researchers have found a link between general personality qualities and a wide range of behaviours after a great deal of effort to create as well as verify an universally acknowledged personality model. Psychological diseases and personal characteristics have been linked [12], as have job happiness and performance [4] and sometimes even amorous achievement [6].

Social media and personality study are brought together in this work through the use of data from people's online profiles. We want to see if people's personality qualities can be predicted by looking at their social media profiles. As a result, it's possible to use online profiles as a framework for understanding individuals by integrating the various findings on the impact of personality characteristics and behaviour on online experiences. Users' introversion or extroversion, for example, could influence the friend suggestion algorithm.

Facebook profiles don't reflect a "idealised" picture of a person's true personality, according to previous research [3]. Due of its large user base (about 200 million), we anticipate that Twitter will exhibit many of the same features.

In order to test 279 people, we used Twitter to administer the Big Five Personality Inventory. They posted their most recent 2000 tweets on Twitter during the procedure (tweets).

A text analysis programme was used to extract a feature set from this data. The data we gathered allowed us to create a personality model that can accurately predict every one of the five factors of a person's personality to within 11% to 18% of their actual values.

Predicting a person's personality has far-reaching effects. Including both colleagues and students, personality qualities have been linked to success. Personality insights may be useful for social networking platforms that aim to facilitate these kinds of connections. Personality and interfaces research shows that users are more responsive and trust information offered from their own personality features [11] (such as the preference of introverts for messages delivered from the standpoint of an introvert). If a user's personality can be deduced from their twitter profile, online marketers and programs could use this information to tailor their message and presentation to the individual.

To begin, we'll go over the history of the Big Five Personality Score and other relevant research on the relationship between personality and the internet. Methods for assessing and interpreting Twitter profile information are then presented in detail. It is helpful to look at the correlations between various profile characteristics and personality traits in

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order to get a better sense of how these two things are connected. Here, we detail the machine learning approaches [13] we utilised for classification and demonstrate how we make significant and big increases over baseline categorization on each personality trait. We'll wrap things off by talking about the ramifications of this research for social media platforms and businesses that might use social networking sites to better understand their customers.

II. RELATED WORK

The Five Factor Model of Personality

Personality structure can be measured by using the "Big Five" model of personality traits, which has seen extensive research and is widely recognised. Tapes and Chrystal [7] conceived of the five personality domains as the essential features that emerged from assessments of prior personality tests [9], namely Openness, Conscientiousness, Extraversion, Agreeability, and Neuroticism.
Using a five-factor model, McCrae & Costa [8] and John [11] have found that the model is applicable to people of all ages, genders, and cultural backgrounds. It's been demonstrated in several studies [9], [10], [1], [7] that alternative tests, languages, and analysis methodologies have no effect on the models' validity. Many psychologists now consider the Big Five to be the only valid model of personality [4], [14]. For this reason, the Big Five qualities are considered to be lexical in nature [13, [9], [10], [12] because of their use of trait names. The following are characteristics of the Big Five traits:

- Curiosity: clever, imaginative, and curious.
  Individuals with high test scores are more likely to be creative and well-educated, as well as open to new ideas and perspectives.
  Responsible, organised, and persistent are all examples of conscientiousness.
  Individuals with a high degree of conscientiousness tend to be very successful, hard-working, and meticulous planners.
- Extroversion: sociable, outgoing, and confident. Extroverts are characterised by their outgoing nature and enthusiasm.
  Helpful and nurturing are examples of agreeableness. Agreeable people keep the peace and are often hopeful and trustworthy of others.
- Neuroticism: apprehensive, insecure, and apprehensive.
- As a result, neurotics tend to have mood swings, be uptight, and be more susceptible to unpleasant emotions.

In the field of Personality and Social Media Research

To the best of knowledge, this is the first study to examine the connection between information provided about one's online persona in social networking profiles. Personality and social networking, on the other hand, has been the subject of a few studies in the past. Extrovertism and conscientiousness have been proven to positively connect with the facilitating conditions of use of social networking websites. Extrovertism has also been proven to have a favourable link with the perceived usefulness of such sites. Several research [2], [4], found a connection between extroversion and the extent of a person's social network. Other personality factors have also yielded conflicting results. Research in [15] found that persons were more likely to pick companions with similar cooperativeness, gregariousness, and flexibility scores as well as those with higher agreeableness scores. A link between openness and the number of friends, on the other hand, was found in [14].

The Big Five: Real-World Applications

There has been a great deal of study done on the influence of personality on our daily lives and the decisions we make. There are a plethora of connections with others that have been discovered. Facebook friends are based on a person's personality type.
According to [15], friendship choosing was influenced by the three dimensions of extraversion, agreeableness, and openness. It has been found that several facets of romantic relationships are linked to personality characteristics, including partner selection, level of attachment, and success. Study after study has shown that the Big Five qualities are linked to coping reactions like revenge and rumination [2, 5]. Aside from interpersonal ties, one's personality might influence one's taste. According to a number of studies, one's taste in music can be influenced by one's personality traits such as those of Rentfrow and Gosling. Additionally, Jost et al. demonstrated that personality type might predict which candidate an individual will vote for in 2008. Dog people and cat people have distinct personalities, according to research [7]. Big Five personality qualities have been demonstrated to reliably predict whether consumers favour national or independent brands in marketing and advertising [8]. The merger of temperament analysis and consumer profiling has a bright future thanks to studies like this one.

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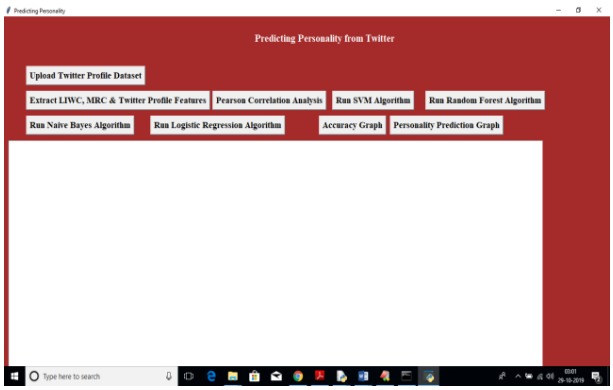
Many research have shown that personality profiles can be effective in the workplace. Research shows that personality qualities have an impact on a person's job performance and satisfaction, whereas Barrick and Mount [4] identified correlations between individual traits and professional choice and skill. Many variables, including team performance [1], unproductive behaviours [11], and entrepreneurial status, have been shown to be accurately predicted by the Big Five dimensions. Barrick and Mount observed recurring personality characteristics in both high- and low-autonomy roles in the workforce [5], and both studies demonstrated connections between personality and conduct among managers [6].
Human-Computer Interaction pioneer [7] presented an important study on the relationship between personality and interface preference. Five book reviews were read aloud from the perspectives of introverts and extroverts, and the results were compared. Subjects were able to distinguish between the various personality types in the reviews and showed a preference for those that were most like their own. More people bought the book becoming recommended when they had similar personality types.
In [5], this work was expanded to include concepts for designing a graphical user interface. Extroverted and introverted personality types were represented by different GUIs. study participants could recognise personality characteristics and favoured an interface that best suited their own personality type, much like in [10].

III. METHODOLOGY

Openness, Agreeableness, Neuroticism, Extroversion, and Conscientiousness are among the five personality traits the author uses to make his or her predictions about people's traits in this paper.
Intuitive people who express their views in an outspoken or direct manner are referred to as "open." This user expressions could be determined by analysing the user's Twitter profile and tweets; if the individual is intelligent, he will employ open (open words, often known as swear words) or bolder terms in his tweets. We can tell this person is an Openness personality by searching for similar words. Openness personality can be predicted using the LIWC dictionary, which comprises all outspoken or swear words. A predicted score greater than or equal to 0.1 will place this individual in this category.
Agreeable people are those who use words like 'am, will have, and so this words also refers to articles or auxiliary verbs to describe their actions. It is possible to predict a person's agreeableness based on their tweets because the MRC vocabulary includes all words in these categories.
People who use words like "ugly," "nasty," "sad," and similar expressions are thought to be neurotic. We can predict this category's score by searching for specific words in tweets.
A person who has a large number of friends, followers, or followers on Twitter falls into this category.
Conscientious folks are those who put out thoughtful suggestions in their writing.
A person's personality can be predicted by looking at their Twitter profile and posts and analysing the following five traits: openness, conscientiousness, extroversion, agreeableness, and neuroticism.
We will use the Independent Variables and dependent variable formula to calculate the average score for each of the five features based on the tweets. Person falls into a specific category if their score for any feature is greater than 0.1. An individual is classified as belonging to more than one personality type if they have a 0.1 value for each of the other traits. A person's openness and conscientiousness can be characterised by the same person.
SVM, Random Forest, Nave Bayes, and Logistic Regression techniques will be used to determine the correctness of the dataset and the algorithms.

IV. RESULT AND DISCUSSION

This project makes use of a Twitter dataset in JSON format that includes tweets and user information. Each file in the tweets folder contains tweets from a single user.
To run the project to get below result



The Upload Twitter Profile Dataset tab can be found in the results above

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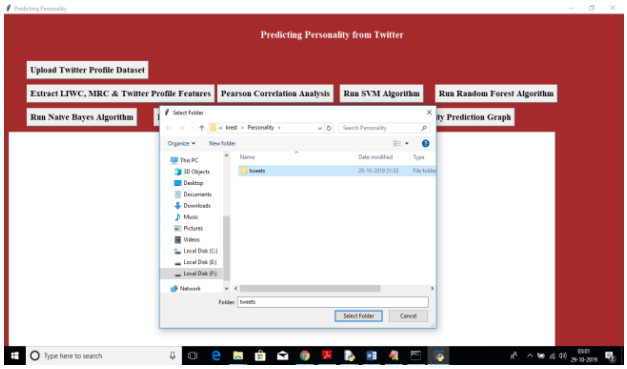
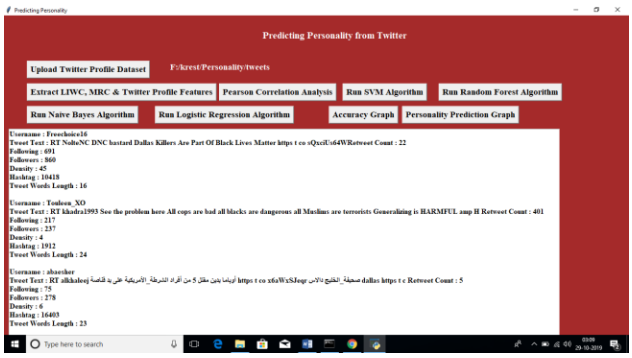
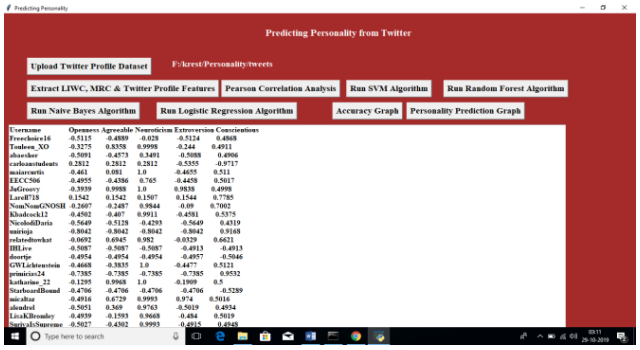


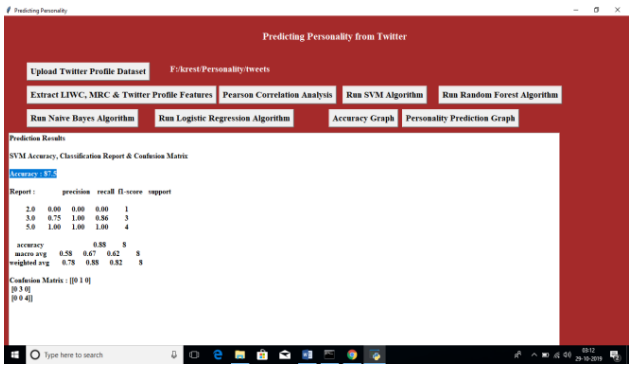
Uploading your tweets yielded the aforementioned outcome; now click on the 'Extract LIWC Features' tab to obtain the tweets' and profile's features.



We can see in the above results that we extracted information from tweets and profiles, including such tweet text, following, and followers, among others. If you scroll down, you'll see all of your profiles' information. In order to obtain scores for each of the five features, click on Pearson Correlation Analysis



Usernames are listed in the first column of the above screen, while the remaining columns display the features score. To get SVM Accuracy, click on the run SVM Algorithm tab



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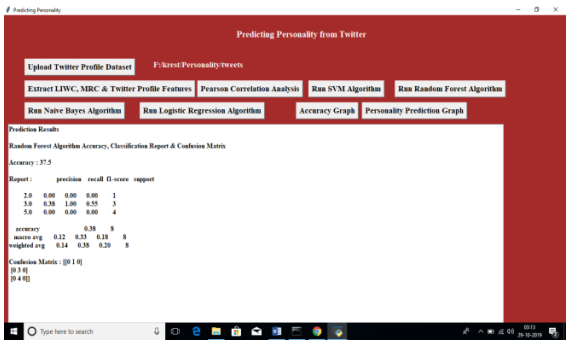
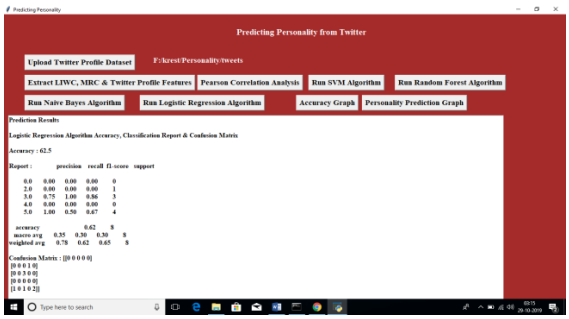
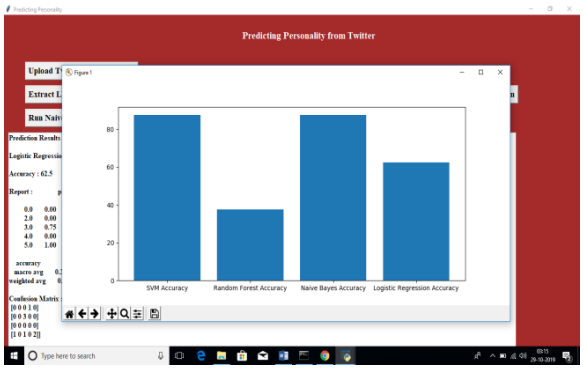
SVM accuracy is 87.5 percent in the above outcome; similarly, click on Run Random Forest Algorithm to obtain its accuracy



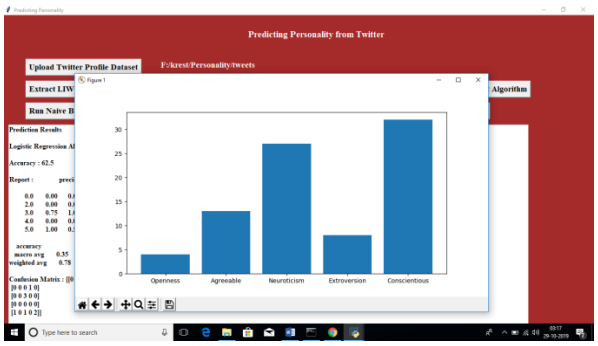
In order to identify its performance, execute Naive Bayes and Logistic Regression Algorithms



To view the accuracy graph shown below, click the Accuracy Graph tab



The x-axis shows the name of the algorithm, and the y-axis represents the algorithms accuracy. To see how many people fall into each group click on the Personality Prediction Graph tab



It's clear from this graph that the x-axis reflects a feature's name, and the y-axis shows the number of persons in that category.

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V. CONCLUSION

On Twitter, a user's Big Five personality qualities could be predicted by the information they post publicly. Through the use of the Twitter Website, we were able to collect data from our participants' public accounts in addition to their responses to a personality test. After analysing this data, we discovered numerous tiny relationships. ZeroR and Gaussian Processes, two machine learning algorithms, were trained to predict results on every one of the five traits to within 11% – 18% of their actual value. With the ability to predict a user's personality traits, a wide range of possibilities for personalising interfaces and information are opened up. Some of these chances for advertising and intuitive interfaces have been explored previously. To be sure, there is still much to be done.

The relationship between one's personality and one's social network should be examined. Although we looked at the handful of connections and the density of the social network, we did not compare the personality ratings of friends. Researchers have yet to explore the relationships between traits such as personality, tie strength [13], trust [14], as well as other relevant aspects. We can begin to answer increasingly complex issues about how to provide users with trustworthy, socially relevant, and well-presented information by enhancing our awareness of these relationships.

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