Sentiment Analysis and User Behavior Prediction in Social Networks

LIU MINGJIE

UNIVERSITI TEKNOLOGI MALAYSIA

ABSTRACT

The popularity of social media generates a huge amount of user-generated content, which is rich in data resources and is useful for applications like targeted advertising, content recommendation, and social network analysis. However, it remains challenging to conduct sentiment analysis and user behavior prediction because human languages and behaviors are so complex and diverse. In view of this, the research aims to develop effective models and methods to cope with the challenges in sentiment analysis and user behavior prediction in social networks. Focusing on specific social network platforms and target user groups, the study will employ natural language processing and machine learning techniques to analyze user-generated content and user behavior data. The study will then establish models for sentiment analysis and user behavior prediction and assess their effectiveness through a set of indicators while pinpointing major factors affecting user behavior through feature analysis and model interpretation. The research outcomes will contribute to effective ways of sentiment analysis and user behavior prediction in social networks and will enable enterprises, researchers, and policymakers to better understand user behaviors and develop marketing strategies targeting these behaviors.

Click or tap here to enter text.

ABSTRAK

Populariti media sosial menjana sejumlah besar kandungan yang dijana pengguna, yang kaya dengan sumber data dan berguna untuk aplikasi seperti pengiklanan yang disasarkan, pengesyoran kandungan dan analisis rangkaian sosial. Walau bagaimanapun, masih mencabar untuk menjalankan analisis sentimen dan ramalan tingkah laku pengguna kerana bahasa dan tingkah laku manusia sangat kompleks dan pelbagai. Sehubungan dengan itu, penyelidikan bertujuan untuk membangunkan model dan kaedah yang berkesan untuk menghadapi cabaran dalam analisis sentimen dan ramalan tingkah laku pengguna dalam rangkaian sosial. Memfokuskan pada platform rangkaian sosial tertentu dan kumpulan pengguna sasaran, kajian ini akan menggunakan pemprosesan bahasa semula jadi dan teknik pembelajaran mesin untuk menganalisis kandungan yang dijana pengguna dan data tingkah laku pengguna. Kajian itu kemudiannya akan mewujudkan model untuk analisis sentimen dan ramalan tingkah laku pengguna dan menilai keberkesanannya melalui satu set penunjuk sambil menentukan faktor utama yang mempengaruhi tingkah laku pengguna melalui analisis ciri dan tafsiran model. Hasil penyelidikan akan menyumbang kepada cara analisis sentimen dan ramalan tingkah laku pengguna yang berkesan dalam rangkaian sosial dan akan membolehkan perusahaan, penyelidik dan penggubal dasar untuk lebih memahami gelagat pengguna dan membangunkan strategi pemasaran yang menyasarkan gelagat ini.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 Introduction

Social networks have become an example of an inherent fusion of our daily lives since they can be aligned with our routine easily and change everything about communication, information, and social interactions as we know it. This starts from Facebook to Twitter to Instagram to TikTok - now all have developed as the era of virtual spaces, where individuals talk to their friends and family, as well as sharing both new and old content, giving their thoughts. Hence, a staggering amount of data published by the users and found on the platforms has been created, leading to making it a benefit hub for a wide range of applications.

Certainly, now businesses focus on the idea that social media data is a gold mine for marketing communications, product promotion, and understanding consumer and market trends. The key value comes from how meaning can be extracted out of user behavior and sentiment; however, this is what is the seller that is able to make marketing strategies more segmented, personalized, and connected to the customer. The difficulty in accumulating meaningful analytics from the mountains of big data is a dream that is, to a large extent, not possible. The complexities, with their diversities, that lie therein due to human speech and activities, still remain very difficult to analyze or to interpret to coherent ness in the data that is user-generated. The statement of social media, including sarcasm and irony between friends and family, adds a challenge to the tests beyond what lever will be adequate. The user's behavior, on the other hand, could be explained by the fact that individual tastes, people, and

other atmospheric variables collectively bring about complexity in predicting with certainty.

1.2 Background of the Problem

Data is the primary information related to video social networks, including text, images, and videos. Sentiment analysis or making forecasts about user behavior as derived from this data compiled the list of tasks having the greatest importance for many applications. Nevertheless, the undeniable aspect, that language is intricate and full of variety, makes this kind of task difficult to do, despite the ongoing progress in the field of data processing in linguistic science. Instead of this, prevalent techniques do not utilize the users' interactions with the content and context-aware information; in the end, the outcomes of these approaches will be less accurate and impede the formation of personal customer experiences and targeted marketing strategies. This will be done by creating new data models with the use of contextual and user-based information, and then applying these models to predict results and generate impactful ideas based on that.

1.3 Statement of the Problem

Sentiment analysis and user behavior prediction can be made easier with the application of an optimal method, which is a big factor in advancing hyper-personalized experiences and marketing strategies. Commonly, approaches are created without taking into account context and interaction, and they do not represent the utmost specifics of the task. As a result, it becomes a missed opportunity for businesses, since they miss the opportunity to know what customers are really all about and what their consumers need, which might have in return tabled the business. This study is going to act as a platform that will assess the user behavior and utilize

predetermined factors to help the businesses create strategies that are in line with the customers' wishes and help make informed decisions in the end.

1.4 Research Questions

The following are research questions that this study sought to address:

1. How can efficient models be developed for the sentiment analysis of social network data? This question will cover different approaches, such as techniques of natural language processing, machine learning algorithms, and deep learning models, to identify those that work best for sentiment analysis.
2. How can machine learning techniques be used to predict user behavior in social networks? This question will investigate different machine learning techniques, such as classification, regression, and sequence prediction models, in order to identify the most accurate methods for predicting user behavior.
3. What are the major factors that influence user behavior in social networks? This question will analyze user-generated content and user behavior data to identify the key factors that influence user behavior, such as user demographics, social network structure, and content features.
4. How is the performance of sentiment analysis and user behavior prediction models evaluated? The question after that will tend to explain several evaluation metrics: accuracy, precision, recall, F1 score, among others, for performance evaluation to provide some idea about areas for further improvements in developed models.

1.5 Objectives of the Research

The objectives of this research are:

1. Data Collection and Preprocessing: Collect and preprocess social network data, including text, images, and videos, using appropriate data collection tools and preprocessing techniques to ensure data quality and consistency.
2. Sentiment Analysis Model Development: Develop a sentiment analysis model using natural language processing techniques such as sentiment lexicons, machine learning algorithms, or deep learning models, and compare their performance to identify the most effective approach.
3. User Behavior Prediction Model Development: The development of a user behavior prediction model can be done using classification, regression, or sequence prediction models based on machine learning techniques, which need to be optimized with regard to the highest achievable value of prediction accuracy.
4. Identification of Key Factors: Key factors affecting user behavior in social networks will be identified through feature analysis and model interpretation; the relationships between different factors could be understood with the help of statistical analysis and visualization techniques.
5. Model Evaluation: Assess the performance of the sentiment analysis and user behavior prediction models using various metrics such as accuracy, precision, recall, and F1 score, and compare the performance of developed models against the state-of-the-art approaches.
6. Documentation and Reporting: Document the research findings in detail on a report, inclusive of methodology, results, and conclusions, and present the research findings through publications and presentations.

1.6 Scope of the Study

The basis of this research will focus on a specific social network platform and target user group. The data collection will be done strictly for public data, and personally identifiable information should have prior consent from the users. The models that will be developed for sentiment analysis and prediction of user behavior are prototypical; their implementation will also be for the research environment only. This scope enables focused investigation and ensures ethical data collection practices.

1.7 Significance of the study

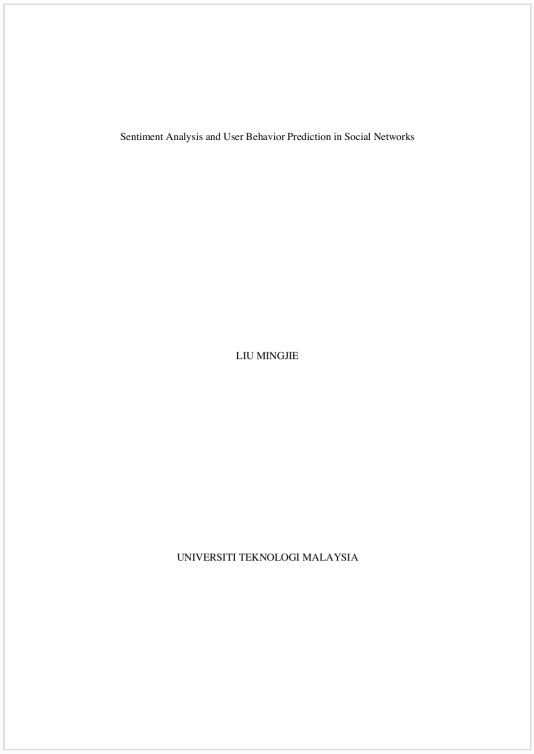
The results from this study will add to the establishment of efficient methodologies in sentiment analysis and the prediction of user behavior on social networks. The developed models will provide useful information to businesses, researchers, and policy-makers on the nature of user behavior, which would enable the devising of marketing strategies aimed at specific behaviors. The proposed research contributes to a further advancement of knowledge within the arena of social network analysis and data science and informs other major fields such as healthcare, education, and public policy.

Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author:	Liu Mingjie MCS241019
Assignment title:	Chapter_1
Submission title:	Chapter1_Liu Mingjie.docx
File name:	Chapter1_Liu_Mingjie.docx
File size:	39.75K
Page count:	9
Word count:	1,604
Character count:	9,290
Submission date:	29-Nov-2024 08:15PM (UTC+0800)
Submission ID:	2535297701


Sentiment Analysis and User Behavior Prediction in Social Networks

LIU MINGJIE

UNIVERSITI TEKNOLOGI MALAYSIA