

STUDY ON MENTAL DISORDER DETECTION VIA SOCIAL MEDIA MINING

Submitted in partial fulfillment of the requirements for the award of
Bachelor of Engineering degree in Computer Science and Engineering

by

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(DEEMED TO BE UNIVERSITY)**

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This is to certify that this Project Report is the bonafide work of **M PAVAN VENKATA SIVA NAGA SAI RAM (Reg.No.37110423)** who carried out the project entitled " **STUDY ON MENTAL DISORDER DETECTION VIA SOCIAL MEDIA MINING**" under my supervision from **November 2020** to **March 2021**.

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DECLARATION

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Abstract

An increasing number of social network mental disorders (SNMDs), such as Cyber-Relationship Addiction, Information Overload, and Net Compulsion, have been recently noted. Symptoms of these mental disorders are usually observed passively today, resulting in delayed clinical intervention. In this paper, we argue that mining online social behavior provides an opportunity to actively identify SNMDs at an early stage. It is challenging to detect SNMDs because the mental factors considered in standard diagnostic criteria (questionnaire) cannot be observed from online social activity logs. Our approach, new and innovative to the practice of SNMD detection, does not rely on self-revealing of those mental factors via questionnaires. Instead, we propose a machine learning framework, namely, Social Network Mental Disorder Detection (SNMDD), that exploits features extracted from social network data to accurately identify potential cases of SNMDs. We also exploit multi-source learning in SNMDD and propose a new SNMDbased Tensor Model (STM) to improve the performance. Our framework is evaluated via a user study with 3126 online social network users. We conduct a feature analysis, and also apply SNMDD on large-scale datasets and analyze the characteristics of the three SNMD types. The results show that SNMDD is promising for identifying online social network users with potential SNMDs.

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Chapter -1

INTRODUCTION

Social media website is defined as “a website that facilitates meeting people, finding like minds, communicating and sharing content, and building community”; this kind of website allows or encourages various types of activities, such as commercial, social, or a combination of the two. Social media categories include digital library, e-commerce, entertainment, forum, geolocation, social bookmark, social review, social game, and social network. Social network is the subcategory of social media, which is the social structure of people who are joined by common interest. Social media are social channels of communication using web-based technologies, desktop computers, and mobile technologies. These technologies create highly interactive platforms through which individuals, communities, and organizations can share information, discuss, rate, comment, and modify user-generated and online contents. These advancements enable communication among businesses, organizations, communities, and individuals. Social media technologies change the way individuals and large organizations communicate, and they are increasingly being developed.

Wide range of applications in business and public policy uses sentiment analysis. Sentimental analysis is now being used from specific product marketing to antisocial behaviour recognition. Businesses and organizations have always been concerned about how they are perceived by the public. This concern results from a variety of motivations, including marketing and public relations. Before the era of Internet, the only way for an organization to track its reputation in the media was to hire someone for the specific task of reading newspapers and manually compiling lists of positive, negative and neutral references to the organization, it could undertake expensive surveys of uncertain validity. Today, many newspapers are published online. Some of them publish dedicated online editions, while others publish the pages of their print edition in PDF. In addition to newspapers, there are a wide range of opinionated articles posted online in blogs and other social media. This opens up the possibility of automatically detecting positive or negative mentions of an organization in articles published online, thereby dramatically reducing the effort required to collect this type of information. To this end,

Organizations are becoming increasingly interested in acquiring fine sentiment analysis from news articles. Fine-grained sentiment analysis is an extremely challenging problem because of the variety of ways in which opinions can be expressed. News articles present an even greater challenge, as they usually avoid overt indicators of attitudes. However, despite their apparent neutrality, news articles can still bear polarity if they describe events that are objectively positive or negative. Many techniques used for sentiment analysis involve naïve approaches based on spotting certain keywords which reveal the author or speaker's emotions. We use naïve performs fine-grained sentiment analysis to classify sentences as positive, negative or neutral.

Chapter -2

LITERATURE REVIEW

Literature survey is the most important step in software development process. Before developing the tool it is necessary to determine the time factor, economy and company strength. Once these things are satisfied, then the next step is to determine which operating system and language can be used for developing the tool. Once the programmers start building the tool the programmers need lot of external support. This support can be obtained from senior programmers, from book or from websites. Before building the system the above consideration are taken into account for developing the proposed system.

The major part of the project development sector considers and fully survey all the required needs for developing the project. For every project Literature survey is the most important sector in software development process. Before developing the tools and the associated designing it is necessary to determine and survey the time factor, resource requirement, man power, economy, and company strength. Once these things are satisfied and fully surveyed, then the next step is to determine about the software specifications in the respective system such as what type of operating system the project would require, and what are all the necessary software are needed to proceed with the next step such as developing the tools, and the associated operations.

A google wave-based fuzzy recommender system to disseminate information in University Digital Libraries 2.0

Nowadays Digital Libraries 2.0 are mainly based on the interaction between users through collaborative applications such as wikis, blogs, etc. or new possible paradigms like the waves proposed by Google. This new concept, the wave, represents a common space where resources and users can work together. The problem arises when the number of resources and users is high, then tools for assisting the users in their information needs are necessary. In this case a fuzzy linguistic recommender system based on the Google Wave capabilities is proposed as tool for communicating researchers interested in common research lines. The system allows the creation of a common space by means a wave as a way of collaborating and exchanging ideas

between several researchers interested in the same topic. In addition, the system suggests, in an automatic way, several researchers and useful resources for each wave. These recommendations are computed following several previously defined preferences and characteristics by means of fuzzy linguistic labels. Thus the system facilitates the possible collaborations between multi-disciplinar researchers and recommends complementary resources useful for the interaction. In order to test the effectiveness of the proposed system, a prototype of the system has been developed and tested with several research groups from the same university achieving successful results.

A hybrid fuzzy-based personalized recommender system for telecom products/services

The Internet creates excellent opportunities for businesses to provide personalized online services to their customers. Recommender systems are designed to automatically generate personalized suggestions of products/services to customers. Because various uncertainties exist within both product and customer data, it is a challenge to achieve high recommendation accuracy. This study develops a hybrid recommendation approach which combines user-based and item-based collaborative filtering techniques with fuzzy set techniques and applies it to mobile product and service recommendation. It particularly implements the proposed approach in an intelligent recommender system software called Fuzzy-based Telecom Product Recommender System (FTCP-RS). Experimental results demonstrate the effectiveness of the proposed approach and the initial application shows that the FTCP-RS can effectively help customers to select the most suitable mobile products or services.

Recommender systems based on social networks

The traditional recommender systems, especially the collaborative filtering recommender systems, have been studied by many researchers in the past decade. However, they ignore the social relationships among users. In fact, these relationships can improve the accuracy of recommendation. In recent years, the study of social-based recommender systems has become an active research topic. In this paper, we

propose a social regularization approach that incorporates social network information to benefit recommender systems. Both users' friendships and rating records (tags) are employed to predict the missing values (tags) in the user-item matrix. Especially, we use a biclustering algorithm to identify the most suitable group of friends for generating different final recommendations. Empirical analyses on real datasets show that the proposed approach achieves superior performance to existing approaches.

A Hybrid Trust-Based Recommender System for Online Communities of Practice

The needs for life-long learning and the rapid development of information technologies promote the development of various types of online Community of Practices. In online CoPs, bounded rationality and metacognition are two major issues, especially when learners face information overload and there is no knowledge authority within the learning environment. This study proposes a hybrid, trust-based recommender system to mitigate above learning issues in online CoPs. A case study was conducted using Stack Overflow data to test the recommender system. Important findings include: (1) comparing with other social community platforms, learners in online CoPs have stronger social relations and tend to interact with a smaller group of people only; (2) the hybrid algorithm can provide more accurate recommendations than celebrity-based and content-based algorithm and; (3) the proposed recommender system can facilitate the formation of personalized learning communities.

RecomMetz: A context-aware knowledge-based mobile recommender system for movie showtimes

Recommender systems are used to provide filtered information from a large amount of elements. They provide personalized recommendations on products or services to users. The recommendations are intended to provide interesting elements to users. Recommender systems can be developed using different techniques and algorithms where the selection of these techniques depends on the area in which they will be applied. This paper proposes a recommender system in the leisure domain, specifically

in the movie showtimes domain. The system proposed is called RecomMetz, and it is a context-aware mobile recommender system based on Semantic Web technologies. In detail, a domain ontology primarily serving a semantic similarity metric adjusted to the concept of “packages of single items” was developed in this research. In addition, location, crowd and time were considered as three different kinds of contextual information in RecomMetz. In a nutshell, RecomMetz has unique features: (1) the items to be recommended have a composite structure (movie theater + movie + showtime), (2) the integration of the time and crowd factors into a context-aware model, (3) the implementation of an ontology-based context modeling approach and (4) the development of a multi-platform native mobile user interface intended to leverage the hardware capabilities (sensors) of mobile devices. The evaluation results show the efficiency and effectiveness of the recommendation mechanism implemented by RecomMetz in both a cold-start scenario and a no cold-start scenario.

A novel hybrid approach improving effectiveness of recommender systems

Recommender systems support users by generating potentially interesting suggestions about relevant products and information. The increasing attention towards such tools is witnessed by both the great number of powerful and sophisticated recommender algorithms developed in recent years and their adoption in many popular Web platforms. However, performances of recommender systems can be affected by many critical issues as for instance, over-specialization, attribute selection and scalability. To mitigate some of such negative effects, a hybrid recommender system, called Relevance Based Recommender, is proposed in this paper. It exploits individual measures of perceived relevance computed by each user for each instance of interest and, to obtain a better precision, also by considering the analogous measures computed by the other users for the same instances. Some experiments show the advantages introduced by this recommender when generating potentially attractive suggestions.

A recommender system for researchers based on bibliometrics

Recommender systems (RSs) exploit past behaviors and user similarities to provide personalized recommendations. There are some precedents of usage in academic environments to assist users finding relevant information, based on assumptions about the characteristics of the items and users. Even if quality has already been taken into account as a property of items in previous works, it has never been given a key role in the re-ranking process for both items and users.

In this paper, we present REFORE, a quality-based fuzzy linguistic REcommender system FOrREsearchers. We propose the use of some bibliometric measures as the way to quantify the quality of both items and users without the interaction of experts as well as the use of 2-tuple linguistic approach to describe the linguistic information. The system takes into account the measured quality as the main factor for the re-ranking of the top-N recommendations list in order to point out researchers to the latest and the best papers in their research fields. To prove the accuracy improvement, we conduct a study involving different recommendation approaches, aiming at measuring their performance gain. The results obtained proved to be satisfactory for the researchers from different departments who took part on the tests.

A peer-to-peer recommender system for self-emerging user communities based on gossip overlays

Gossip-based peer-to-peer protocols proved to be very efficient for supporting dynamic and complex information exchange among distributed peers. They are useful for building and maintaining the network topology itself as well as to support a pervasive diffusion of the information injected into the network. This is very useful in a world where there is a growing need to access and be aware of many types of distributed resources like Internet pages, shared files, online products, news and information. Finding flexible, scalable and efficient mechanisms addressing this topic is a key issue, even with relevant social and economic aspects. In this paper, we propose the general architecture of a system whose aim is to exploit the collaborative exchange of information between peers in order to build a system able to gather similar users and spread useful suggestions among them.

Social and Content Hybrid Image Recommender System for Mobile Social Networks

One of the advantages of social networks is the possibility to socialize and personalize the content created or shared by the users. In mobile social networks, where the devices have limited capabilities in terms of screen size and computing power, Multimedia Recommender Systems help to present the most relevant content to the users, depending on their tastes, relationships and profile. Previous recommender systems are not able to cope with the uncertainty of automated tagging and are knowledge domain dependant. In addition, the instantiation of a recommender in this domain should cope with problems arising from the collaborative filtering inherent nature (cold start, banana problem, large number of users to run, etc.). The solution presented in this paper addresses the abovementioned problems by proposing a hybrid image recommender system, which combines collaborative filtering (social techniques) with content-based techniques, leaving the user the liberty to give these processes a personal weight. It takes into account aesthetics and the formal characteristics of the images to overcome the problems of current techniques, improving the performance of existing systems to create a mobile social networks recommender with a high degree of adaptation to any kind of user.

A Personalized Recommender System Based on a Hybrid Model

Recommender systems are means for web personalization and tailoring the browsing experience to the users' specific needs. There are two categories of recommender systems; memory-based and model-based systems. In this paper we propose a personalized recommender system for the next page prediction that is based on a hybrid model from both categories. The generalized patterns generated by a model based techniques are tailored to specific users by integrating user profiles generated from the traditional memory-based system's user-item matrix. The suggested system offered a significant improvement in prediction speed over traditional model-based usage mining systems, while also offering an average improvement in the system accuracy and system precision by 0.27% and 2.35%, respectively.

Chapter 3

Aim and Scope

EXISTING SYSTEM

- E-commerce reviews reveal the customers' attitudes on the products, which are very helpful for customers to know other people's opinions on interested products. Meanwhile, producers are able to learn the public sentiment on their products being sold in E-commerce platforms.
- Generally, E-commerce reviews involve many aspects of products, e.g., appearance, quality, price, logistics, and so on.
- Therefore, sentiment analysis on E-commerce reviews has to cope with those different aspects.
- The problem with public auction is that the participation of the general public is very limited.

PROPOSED SYSTEM

In this paper, we aim to explore data mining techniques to detect three types of SNMDs

1) Cyber-Relationship (CR) Addiction, which includes addiction to social networking, checking and messaging to the point where social relationships to virtual and online friends become more important than real-life ones with friends and families

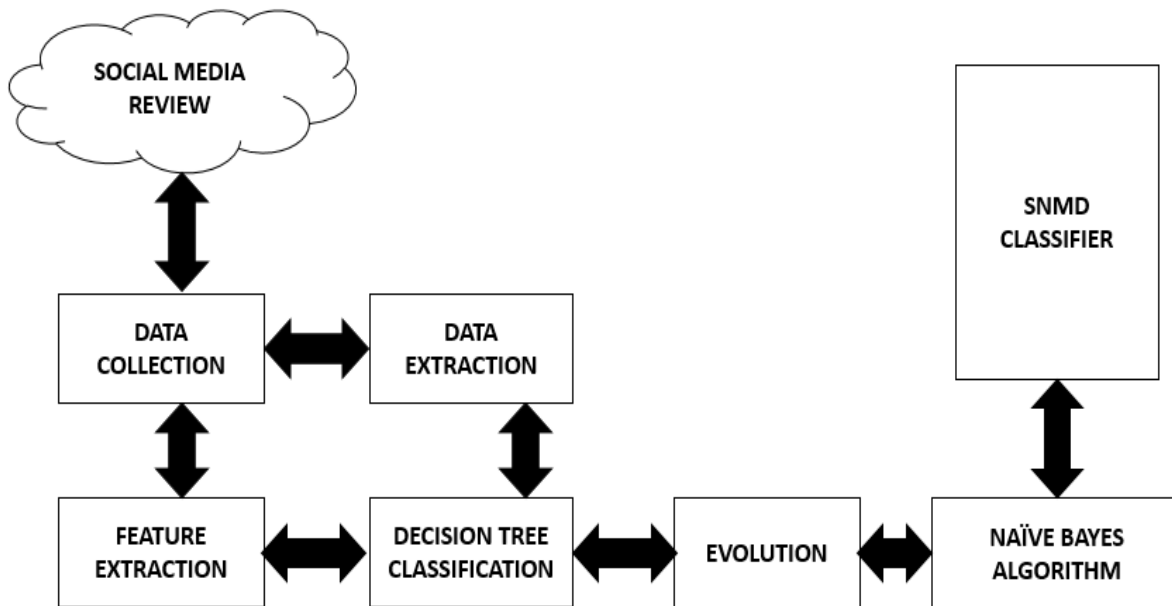
2) Net Compulsion (NC), which includes compulsive online social gaming or gambling, often resulting in financial and job-related problems.

3) Information Overload (IO), which includes addictive surfing of user status and news feeds, leading to lower work productivity and fewer social interactions with families and friends offline.

ADVANTAGES OF PROPOSED SYSTEM

- Collaborative Filtering
- Content Based Filtering
- Clustering

SYSTEM ARCHITECTURE



SYSTEM REQUIREMENTS

HARDWARE REQUIREMENTS

- System : i3 Processor
- Hard Disk : 500 GB.
- Monitor : 15"LED
- Input Devices : Keyboard, Mouse
- Ram : 4GB.

SOFTWARE REQUIREMENTS

- Operating system : Windows
- Coding Language : Python
- IDE : Pi-champ
- Database : MYSQL

Chapter 4

Methodology

Python:

Python is a high-level, interpreted, interactive and object-oriented scripting language. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages.

- **Python is Interpreted** – Python is processed at runtime by the interpreter. You do not need to compile your program before executing it. This is similar to PERL and PHP.
- **Python is Interactive** – You can actually sit at a Python prompt and interact with the interpreter directly to write your programs.
- **Python is Object-Oriented** – Python supports Object-Oriented style or technique of programming that encapsulates code within objects.
- **Python is a Beginner's Language** – Python is a great language for the beginner-level programmers and supports the development of a wide range of applications from simple text processing to WWW browsers to games.

History of Python

Python was developed by Guido van Rossum in the late eighties and early nineties at the National Research Institute for Mathematics and Computer Science in the Netherlands.

Python is derived from many other languages, including ABC, Modula-3, C, C++, Algol-68, SmallTalk, and Unix shell and other scripting languages.

Python is copyrighted. Like Perl, Python source code is now available under the GNU General Public License (GPL).

Python is now maintained by a core development team at the institute, although Guido van Rossum still holds a vital role in directing its progress.

Python Features

Python's features include –

- **Easy-to-learn** – Python has few keywords, simple structure, and a clearly defined syntax. This allows the student to pick up the language quickly.
- **Easy-to-read** – Python code is more clearly defined and visible to the eyes.
- **Easy-to-maintain** – Python's source code is fairly easy-to-maintain.
- **A broad standard library** – Python's bulk of the library is very portable and cross-platform compatible on UNIX, Windows, and Macintosh.
- **Interactive Mode** – Python has support for an interactive mode which allows interactive testing and debugging of snippets of code.
- **Portable** – Python can run on a wide variety of hardware platforms and has the same interface on all platforms.
- **Extendable** – You can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.
- **Databases** – Python provides interfaces to all major commercial databases.
- **GUI Programming** – Python supports GUI applications that can be created and ported to many system calls, libraries and windows systems, such as Windows MFC, Macintosh, and the X Window system of Unix.
- **Scalable** – Python provides a better structure and support for large programs than shell scripting.

Apart from the above-mentioned features, Python has a big list of good features, few are listed below –

- It supports functional and structured programming methods as well as OOP.
- It can be used as a scripting language or can be compiled to byte-code for building large applications.

- It provides very high-level dynamic data types and supports dynamic type checking.
- It supports automatic garbage collection.
- It can be easily integrated with C, C++, COM, ActiveX, CORBA, and Java.

Python is available on a wide variety of platforms including Linux and Mac OS X. Let's understand how to set up our Python environment.

Getting Python

The most up-to-date and current source code, binaries, documentation, news, etc., is available on the official website of Python <https://www.python.org>.

Windows Installation

Here are the steps to install Python on Windows machine.

- Open a Web browser and go to <https://www.python.org/downloads/>.
- Follow the link for the Windows installer python-XYZ.msifile where XYZ is the version you need to install.
- To use this installer python-XYZ.msi, the Windows system must support Microsoft Installer 2.0. Save the installer file to your local machine and then run it to find out if your machine supports MSI.
- Run the downloaded file. This brings up the Python install wizard, which is really easy to use. Just accept the default settings, wait until the install is finished, and you are done.

The Python language has many similarities to Perl, C, and Java. However, there are some definite differences between the languages.

First Python Program

Let us execute programs in different modes of programming.

Interactive Mode Programming

Invoking the interpreter without passing a script file as a parameter brings up the following prompt –

```
$ python
```

```
Python2.4.3(#1,Nov112010,13:34:43)
```

```
[GCC 4.1.220080704(RedHat4.1.2-48)] on linux2
```

```
Type "help", "copyright", "credits" or "license" for more information.
```

```
>>>
```

Type the following text at the Python prompt and press the Enter –

```
>>>print"Hello, Python!"
```

If you are running new version of Python, then you would need to use print statement with parenthesis as in **print ("Hello, Python!");**. However in Python version 2.4.3, this produces the following result –

```
Hello, Python!
```

Script Mode Programming

Invoking the interpreter with a script parameter begins execution of the script and continues until the script is finished. When the script is finished, the interpreter is no longer active.

Let us write a simple Python program in a script. Python files have extension **.py**. Type the following source code in a test.py file –

```
print"Hello, Python!"
```

We assume that you have Python interpreter set in PATH variable. Now, try to run this program as follows –

```
$ python test.py
```

This produces the following result –

```
Hello, Python!
```

Flask Framework:

Flask is a web application framework written in Python. Armin Ronacher, who leads an international group of Python enthusiasts named Pocco, develops it. Flask is based on Werkzeug WSGI toolkit and Jinja2 template engine. Both are Pocco projects. Http protocol is the foundation of data communication in world wide web. Different methods of data retrieval from specified URL are defined in this protocol.

The following table summarizes different http methods –

Sr.No	Methods & Description
1	GET Sends data in unencrypted form to the server. Most common method.
2	HEAD Same as GET, but without response body
3	POST Used to send HTML form data to server. Data received by POST method is not cached by server.
4	PUT Replaces all current representations of the target resource with the uploaded content.

5	DELETE Removes all current representations of the target resource given by a URL
---	---

By default, the Flask route responds to the **GET** requests. However, this preference can be altered by providing methods argument to **route()** decorator.

In order to demonstrate the use of **POST** method in URL routing, first let us create an HTML form and use the **POST** method to send form data to a URL.

Save the following script as login.html

```
<html>

<body>

<form action="http://localhost:5000/login" method="post">

<p>Enter Name:</p>

<p><input type="text" name="nm"/></p>

<p><input type="submit" value="submit"/></p>

</form>

</body>

</html>
```

Now enter the following script in Python shell.

```
from flask import Flask, redirect, url_for, request

app = Flask(__name__)

@app.route('/success/<name>')
```

```

def success(name):

    return'welcome %s'% name

@app.route('/login',methods=['POST','GET'])

deflogin():

    ifrequest.method=='POST':

        user=request.form['nm']

        returnredirect(url_for('success',name= user))

    else:

        user=request.args.get('nm')

        returnredirect(url_for('success',name= user))

if __name__ == '__main__':

    app.run(debug =True)

```

After the development server starts running, open **login.html** in the browser, enter name in the text field and click **Submit**.

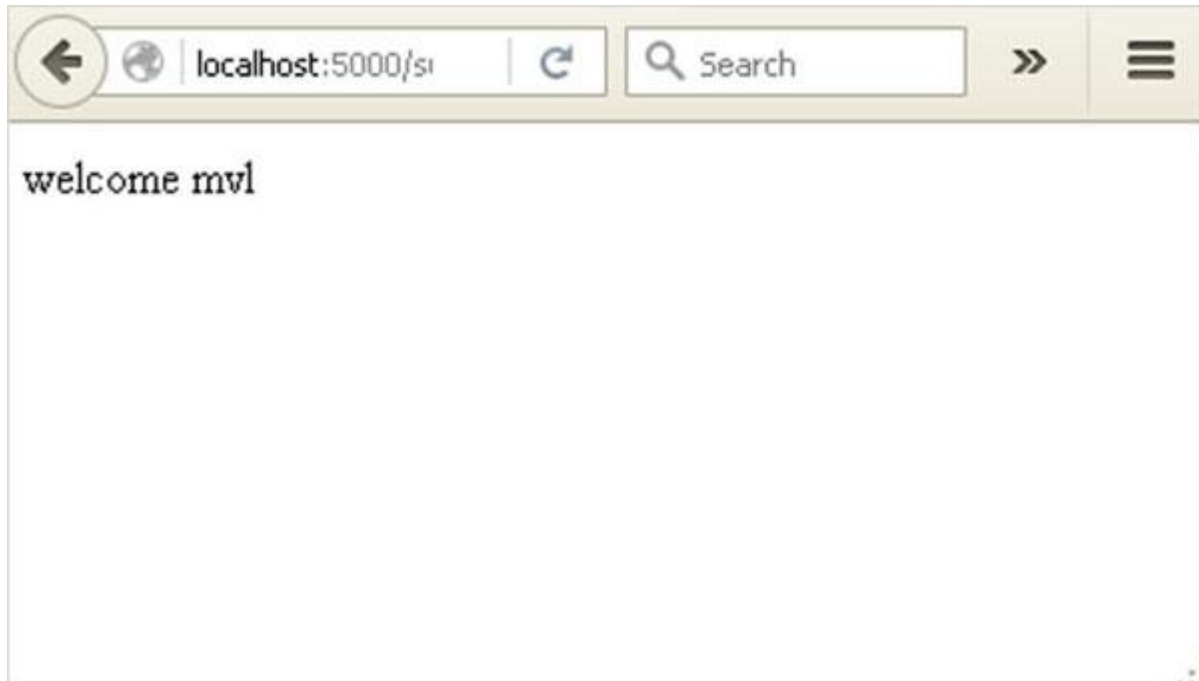
Enter Name:

Form data is POSTed to the URL in action clause of form tag.

http://localhost/login is mapped to the **login()** function. Since the server has received data by **POST** method, value of 'nm' parameter obtained from the form data is obtained by –

```
user = request.form['nm']
```

It is passed to **'/success'** URL as variable part. The browser displays a **welcome** message in the window.



Change the method parameter to **'GET'** in **login.html** and open it again in the browser. The data received on server is by the **GET** method. The value of 'nm' parameter is now obtained by –

```
User = request.args.get('nm')
```

Here, **args** is dictionary object containing a list of pairs of form parameter and its corresponding value. The value corresponding to 'nm' parameter is passed on to '/success' URL as before.

What can Python do?

- Python can be used on a server to create web applications.
- Python can be used alongside software to create workflows.
- Python can connect to database systems. It can also read and modify files.
- Python can be used to handle big data and perform complex mathematics.
- Python can be used for rapid prototyping, or for production-ready software development.

Why Python?

- Python works on different platforms (Windows, Mac, Linux, Raspberry Pi, etc).
- Python has a simple syntax similar to the English language.

- Python has syntax that allows developers to write programs with fewer lines than some other programming languages.
- Python runs on an interpreter system, meaning that code can be executed as soon as it is written. This means that prototyping can be very quick.
- Python can be treated in a procedural way, an object-orientated way or a functional way.

Good to know

- The most recent major version of Python is Python 3, which we shall be using in this tutorial. However, Python 2, although not being updated with anything other than security updates, is still quite popular.
- In this tutorial Python will be written in a text editor. It is possible to write Python in an Integrated Development Environment, such as Thonny, Pycharm, Netbeans or Eclipse which are particularly useful when managing larger collections of Python files.

Python Syntax compared to other programming languages

- Python was designed to for readability, and has some similarities to the English language with influence from mathematics.
- Python uses new lines to complete a command, as opposed to other programming languages which often use semicolons or parentheses.
- Python relies on indentation, using whitespace, to define scope; such as the scope of loops, functions and classes. Other programming languages often use curly-brackets for this purpose.

Python Install

Many PCs and Macs will have python already installed.

To check if you have python installed on a Windows PC, search in the start bar for Python or run the following on the Command Line (cmd.exe):

```
C:\Users\Your Name>python --version
```

To check if you have python installed on a Linux or Mac, then on linux open the command line or on Mac open the Terminal and type:

```
python --version
```

If you find that you do not have python installed on your computer, then you can download it for free from the following website: <https://www.python.org/>

Python Quickstart

Python is an interpreted programming language, this means that as a developer you write Python (.py) files in a text editor and then put those files into the python interpreter to be executed.

The way to run a python file is like this on the command line:

```
C:\Users\Your Name>python helloworld.py
```

Where "helloworld.py" is the name of your python file.

Let's write our first Python file, called helloworld.py, which can be done in any text editor.

```
helloworld.py
```

```
print("Hello, World!")
```

Simple as that. Save your file. Open your command line, navigate to the directory where you saved your file, and run:

```
C:\Users\Your Name>python helloworld.py
```

The output should read:

```
Hello, World!
```

Congratulations, you have written and executed your first Python program.

The Python Command Line

To test a short amount of code in python sometimes it is quickest and easiest not to write the code in a file. This is made possible because Python can be run as a command line itself.

Type the following on the Windows, Mac or Linux command line:

```
C:\Users\Your Name>python
```

From there you can write any python, including our hello world example from earlier in the tutorial:

```
C:\Users\Your Name>python
Python 3.6.4 (v3.6.4:d48eceb, Dec 19 2017, 06:04:45) [MSC v.1900 32 bit (Intel)] on
win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print("Hello, World!")
```

Which will write "Hello, World!" in the command line:

```
C:\Users\Your Name>python
Python 3.6.4 (v3.6.4:d48eceb, Dec 19 2017, 06:04:45) [MSC v.1900 32 bit (Intel)] on
win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print("Hello, World!")
Hello, World!
```

Whenever you are done in the python command line, you can simply type the following to quit the python command line interface:

```
exit()
```

Execute Python Syntax

As we learned in the previous page, Python syntax can be executed by writing directly in the Command Line:

```
>>>print("Hello,                                     World!")  
Hello, World!
```

Or by creating a python file on the server, using the .py file extension, and running it in the Command Line:

```
C:\Users\Your Name>python myfile.py
```

Python Indentations

Where in other programming languages the indentation in code is for readability only, in Python the indentation is very important.

Python uses indentation to indicate a block of code.

Example

```
if 5 > 2:  
    print("Five is greater than two!")
```

Python will give you an error if you skip the indentation:

Example

```
if 5 > 2:  
print("Five is greater than two!")
```

Comments

Python has commenting capability for the purpose of in-code documentation.

Comments start with a #, and Python will render the rest of the line as a comment:

Example

Comments in Python:

```
#This is a comment.  
print("Hello, World!")
```

Docstrings

Python also has extended documentation capability, called docstrings.

Docstrings can be one line, or multiline.

Python uses triple quotes at the beginning and end of the docstring:

Example

Docstrings are also comments:

```
"""This is a  
multiline docstring."""  
print("Hello, World!")
```

MYSQL

MySQL, officially, but also called "My Sequel" is the world's most widely used open-source relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases, though SQLite probably has more total embedded deployments. The SQL phrase stands for Structured Query Language.

The MySQL development project has made its source code available under the terms of the GNU General Public License, as well as under a variety of proprietary agreements. MySQL was owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Oracle Corporation. MySQL is a popular choice of database for use in web applications, and is a central component of the widely used LAMP open source web application software stack (and other 'AMP' stacks).

LAMP is an acronym for "Linux, Apache, MySQL, Perl/PHP/Python." Freesoftware-open source projects that require a full-featured database management system often use MySQL.

For commercial use, several paid editions are available, and offer additional functionality. Applications which use MySQL databases include: TYPO3, MODx, Joomla, WordPress, phpBB, MyBB, Drupal and other software. MySQL is also used in

many high-profile, large-scale websites, including Wikipedia, Google (though not for searches), Facebook, Twitter, Flickr and YouTube.

REQUIREMENT ANALYSIS

Requirement analysis, also called requirement engineering, is the process of determining user expectations for a new modified product. It encompasses the tasks that determine the need for analysing, documenting, validating and managing software or system requirements. The requirements should be documentable, actionable, measurable, testable and traceable related to identified business needs or opportunities and define to a level of detail, sufficient for system design.

FUNCTIONAL REQUIREMENTS

It is a technical specification requirement for the software products. It is the first step in the requirement analysis process which lists the requirements of particular software systems including functional, performance and security requirements. The function of the system depends mainly on the quality hardware used to run the software with given functionality.

Usability

It specifies how easy the system must be use. It is easy to ask queries in any format which is short or long, porter stemming algorithm stimulates the desired response for user.

Robustness

It refers to a program that performs well not only under ordinary conditions but also under unusual conditions. It is the ability of the user to cope with errors for irrelevant queries during execution.

Security

The state of providing protected access to resource is security. The system provides good security and unauthorized users cannot access the system there by providing high security.

Reliability

It is the probability of how often the software fails. The measurement is often expressed in MTBF (Mean Time Between Failures). The requirement is needed in order to ensure that the processes work correctly and completely without being aborted. It can handle any load and survive and survive and even capable of working around any failure.

Compatibility

It is supported by version above all web browsers. Using any web servers like localhost makes the system real-time experience.

Flexibility

The flexibility of the project is provided in such a way that it has the ability to run on different environments being executed by different users.

Safety

Safety is a measure taken to prevent trouble. Every query is processed in a secured manner without letting others to know one's personal information.

NON- FUNCTIONAL REQUIREMENTS

Portability

It is the usability of the same software in different environments. The project can be run in any operating system.

Performance

These requirements determine the resources required, time interval, throughput and everything that deals with the performance of the system.

Accuracy

The result of the requesting query is very accurate and high speed of retrieving information. The degree of security provided by the system is high and effective.

Maintainability

Project is simple as further updates can be easily done without affecting its stability.

Maintainability basically defines that how easy it is to maintain the system. It means that how easy it is to maintain the system, analyse, change and test the application. Maintainability of this project is simple as further updates can be easily done without affecting its stability.

FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

The feasibility study investigates the problem and the information needs of the stakeholders. It seeks to determine the resources required to provide an information systems solution, the cost and benefits of such a solution, and the feasibility of such a solution.

The goal of the feasibility study is to consider alternative information systems solutions, evaluate their feasibility, and propose the alternative most suitable to the organization. The feasibility of a proposed solution is evaluated in terms of its components.

ECONOMICAL FEASIBILITY

This study is carried out to check the economic impact that the system will have

on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

SOCIAL FEASIBILITY

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity.

MODULES:

- Data Collection
- Training
- Classification

MODULES DESCRIPTION:

Data Collection;

We first extract a number of social interaction features to capture the user behavior on social media.

Parasocial relationship (PR). The feature of parasocial relationship is represented as $|a_{out}|/|a_{in}|$, where $|a_{out}|$ and $|a_{in}|$ denote the number of actions a user takes to friends and the number of actions friends take to the user, respectively

Online and offline interaction ratio (ONOFF). As observed by mental health professionals, people who indulge themselves in OSNs tend to snub their friends in real life. We extract the number of check-in logs with friends and the number of “going” events as an indicator of the number of offline activities to estimate the online ($|a_{on}|$)/offline ($|a_{off}|$) interaction ratio.

Social capital (SC). Two types of friendship ties are usually involved in the theory of social capital: i) Bond strengthening (strong-tie), which represents the use of OSNs to strengthen the relationships; and ii) Information seeking (weak-tie), which corresponds to the use of social media to find valuable information.

Social searching vs. browsing (SSB). The human appetitive system is in charge of the addictive behavior. It shows social searching (actively reading news feeds from friends’ walls) creates more pleasure than social browsing (passively reading personal news feeds).

Personal features: The duration, **Self-disclosure based features**, **Temporal behavior features** are extracted from the personal profiles of OSN users

Training:

The given SNMD features of N users extracted from M OSN sources, we construct a three-mode tensor $T \in \mathbb{R}^{N \times D \times M}$ and then conduct Tucker decomposition, a renowned tensor decomposition technique, on T to extract a latent feature matrix $\mathbf{U}$, which presents the latent features of each person summarized from all OSNs. We aim to feed these latent features for SNMD detection. Matrix $\mathbf{U}$ effectively estimates a deficit feature (e.g., a missing feature value unavailable due to privacy setting) of an OSN from the corresponding feature of other OSNs, together with the features of other users with similar behavior. Based on Tucker decomposition on T , we present a new SNMD-based Tensor Model (STM), which enables $\mathbf{U}$ to incorporate important characteristics of SNMDs, such as the correlation of the same SNMD sharing among close friends.

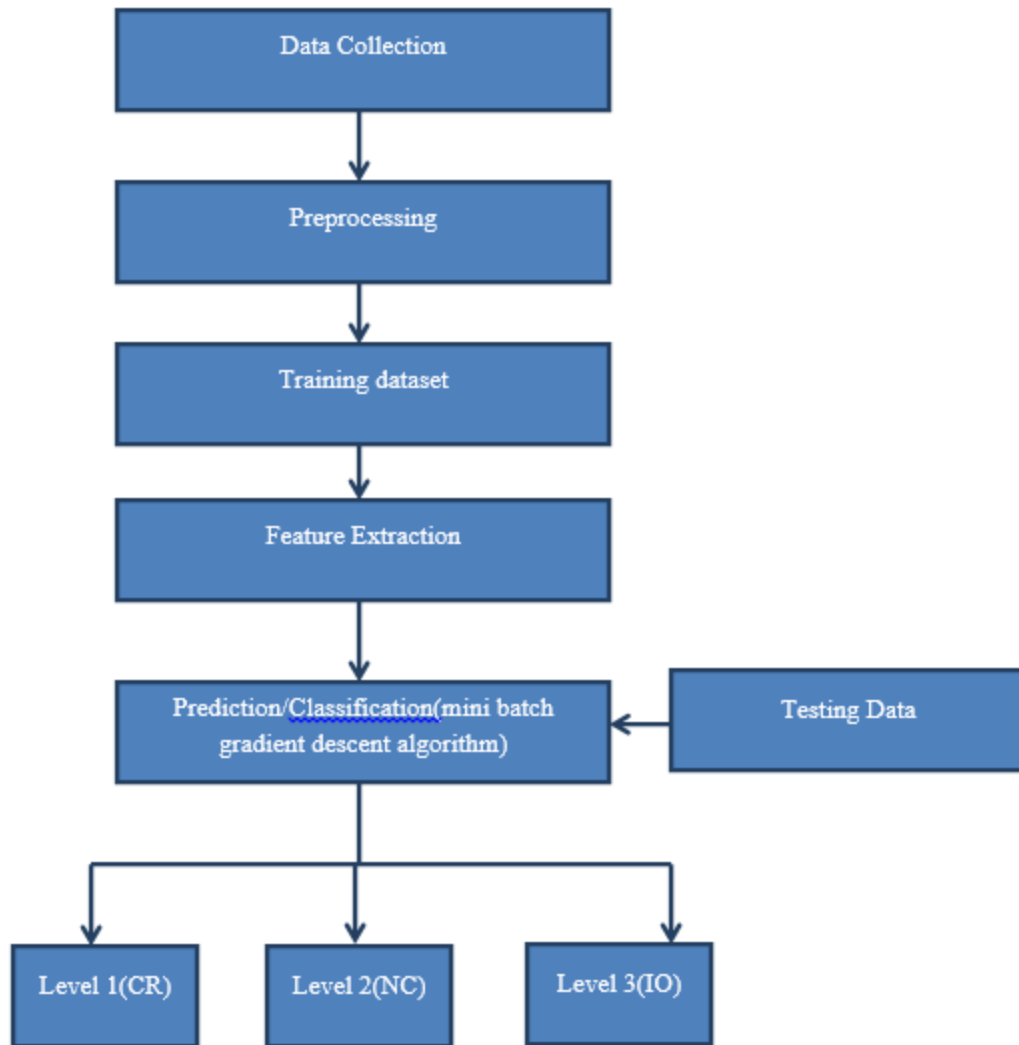
Classification:

Finally, equipped with the new tensor model, we conduct semi-supervised

learning to classify each user by exploiting mini batch gradient descent algorithm. Mini-batch gradient descent is a variation of the gradient descent algorithm that splits the training dataset into small batches that are used to calculate model error and update model coefficients. Mini-batch gradient descent seeks to find a balance between the robustness of stochastic gradient descent and the efficiency of batch gradient descent. Finally predict what type of disorder.

DATA FLOW DIAGRAM:

1. The DFD is also called as bubble chart. It is a simple graphical formalism that can be used to represent a system in terms of input data to the system, various processing carried out on this data, and the output data is generated by this system.
2. The data flow diagram (DFD) is one of the most important modeling tools. It is used to model the system components. These components are the system process, the data used by the process, an external entity that interacts with the system and the information flows in the system.
3. DFD shows how the information moves through the system and how it is modified by a series of transformations. It is a graphical technique that depicts information flow and the transformations that are applied as data moves from input to output.
4. DFD is also known as bubble chart. A DFD may be used to represent a system at any level of abstraction. DFD may be partitioned into levels that represent increasing information flow and functional detail.



UML DIAGRAMS

UML stands for Unified Modeling Language. UML is a standardized general-

purpose modeling language in the field of object-oriented software engineering. The standard is managed, and was created by, the Object Management Group.

The goal is for UML to become a common language for creating models of object oriented computer software. In its current form UML is comprised of two major components: a Meta-model and a notation. In the future, some form of method or process may also be added to; or associated with, UML.

The Unified Modeling Language is a standard language for specifying, Visualization, Constructing and documenting the artifacts of software system, as well as for business modeling and other non-software systems.

The UML represents a collection of best engineering practices that have proven successful in the modeling of large and complex systems.

The UML is a very important part of developing objects oriented software and the software development process. The UML uses mostly graphical notations to express the design of software projects.

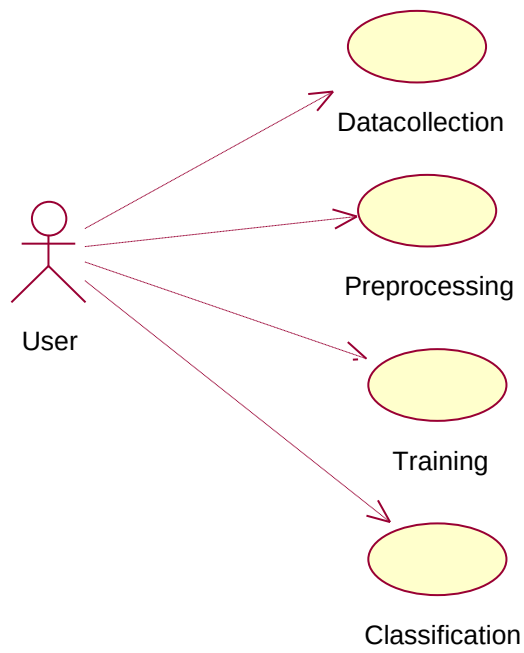
GOALS:

The Primary goals in the design of the UML are as follows:

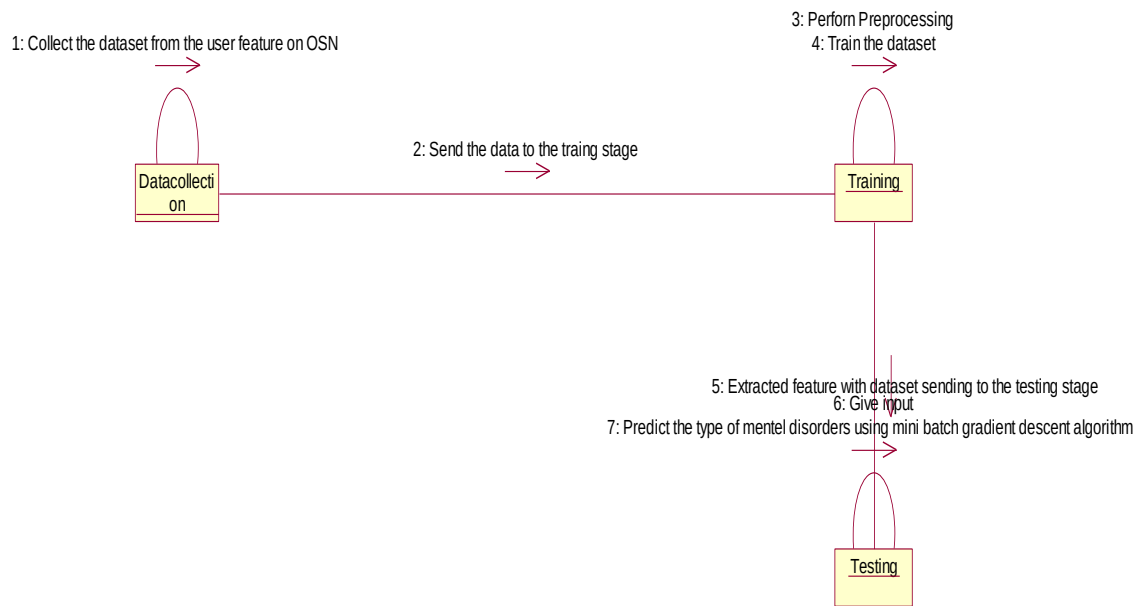
1. Provide users a ready-to-use, expressive visual modeling Language so that they can develop and exchange meaningful models.
2. Provide extendibility and specialization mechanisms to extend the core concepts.
3. Be independent of particular programming languages and development process.
4. Provide a formal basis for understanding the modeling language.
5. Encourage the growth of OO tools market.
6. Support higher level development concepts such as collaborations, frameworks, patterns and components.
7. Integrate best practices.

USE CASE DIAGRAM:

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted.

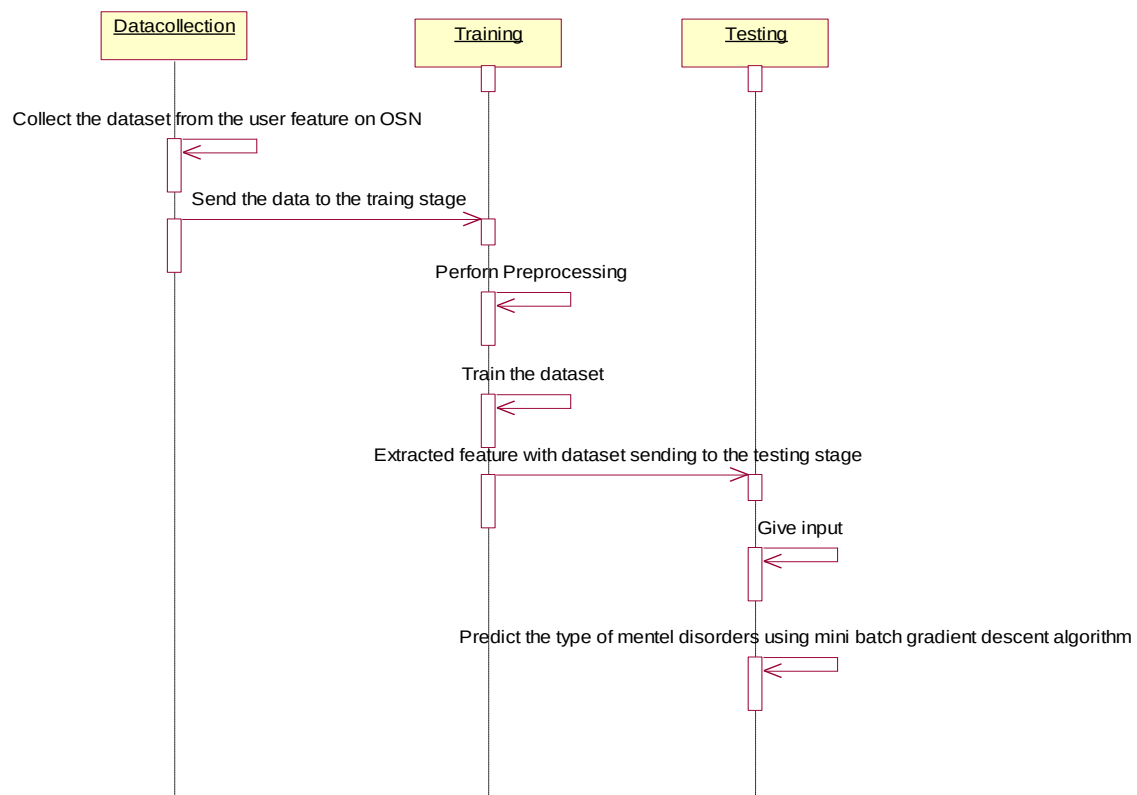


COLLABORATION DIAGRAM:



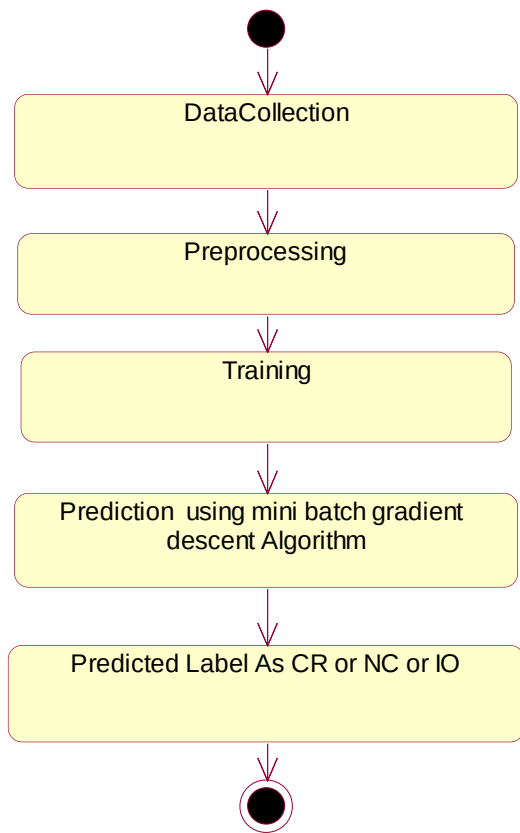
SEQUENCE DIAGRAM:

A sequence diagram in Unified Modeling Language (UML) is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams.



ACTIVITY DIAGRAM:

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control.



Chapter 5

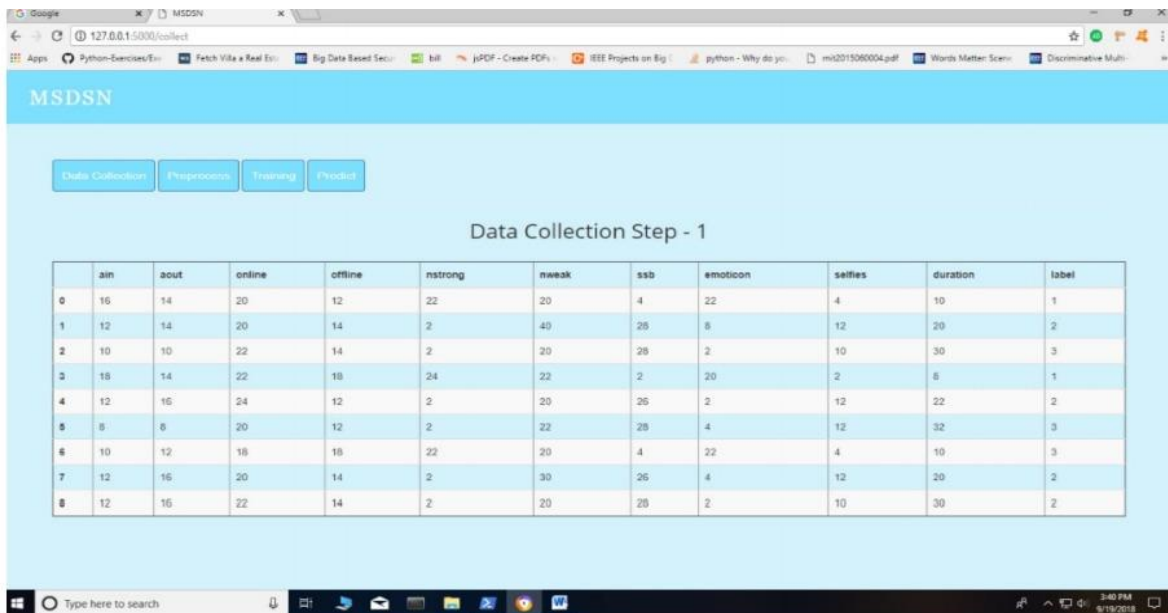
Results and Discussion

SYSTEM DESIGN AND TESTING PLAN

INPUT DESIGN

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.
- Methods for preparing input validations and steps to follow when error occur.



MSDSN

Data Collection Step - 1

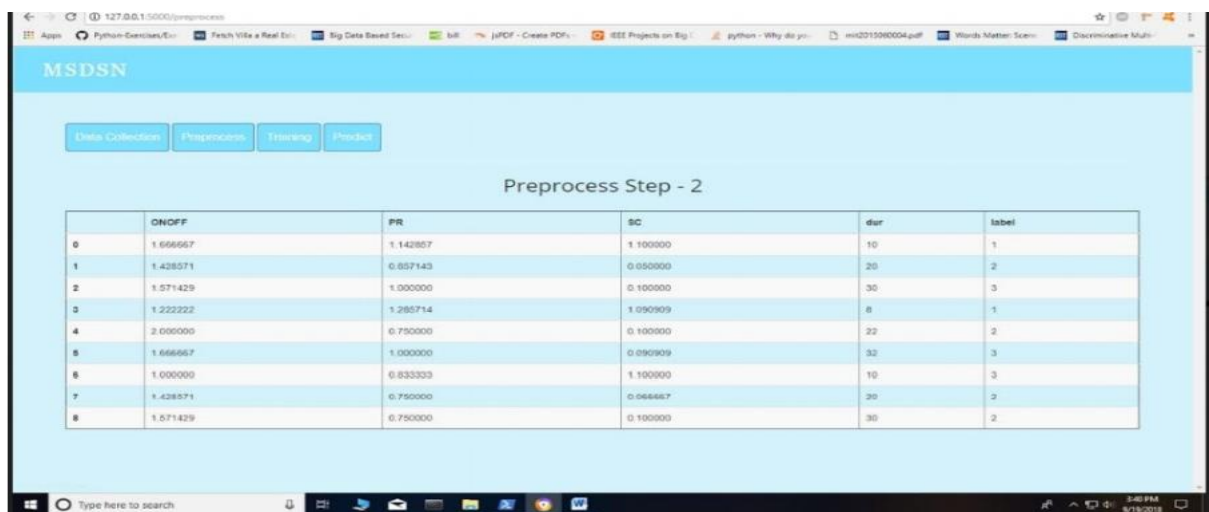
	aim	acout	online	offline	nstrong	nweak	ssb	emotion	selfies	duration	label
0	16	14	20	12	22	20	4	22	4	10	1
1	12	14	20	14	2	40	26	8	12	20	2
2	10	10	22	14	2	20	28	2	10	30	3
3	18	14	22	18	24	22	2	20	2	8	1
4	12	16	24	12	2	20	26	2	12	22	2
5	8	6	20	12	2	22	28	4	12	32	3
6	10	12	18	18	22	20	4	22	4	10	3
7	12	16	20	14	2	30	26	4	12	20	2
8	12	16	22	14	2	20	28	2	10	30	2

OUTPUT DESIGN

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

The output form of an information system should accomplish one or more of the following objectives.

- Convey information about past activities, current status or projections of the
- Future.
- Signal important events, opportunities, problems, or warnings.
- Trigger an action.
- Confirm an action.



The screenshot shows a web application interface with a light blue header and navigation bar. The main content area displays a table titled 'Preprocess Step - 2'. The table has six columns: an index column, 'ONOFF', 'PR', 'SC', 'dur', and 'label'. There are 9 rows of data. The interface also includes a search bar at the bottom and a taskbar at the very bottom of the browser window.

	ONOFF	PR	SC	dur	label
0	1.566567	1.142857	1.100000	10	1
1	1.428571	0.857143	0.050000	20	2
2	1.571429	1.000000	0.100000	30	3
3	1.222222	1.285714	1.090909	8	1
4	2.000000	0.750000	0.100000	22	2
5	1.566567	1.000000	0.090909	32	3
6	1.000000	0.833333	1.100000	10	3
7	1.428571	0.750000	0.066667	20	2
8	1.571429	0.750000	0.100000	30	2

Test plan

Software testing is the process of evaluation a software item to detect differences between given input and expected output. Also to assess the feature of a software item. Testing assesses the quality of the product. Software testing is a process that should be done during the development process. In other words software testing is a verification and validation process.

Verification

Verification is the process to make sure the product satisfies the conditions imposed at the start of the development phase. In other words, to make sure the product behaves the way we want it to.

Validation

Validation is the process to make sure the product satisfies the specified requirements at the end of the development phase. In other words, to make sure the product is built as per customer requirements.

Basics of software testing

There are two basics of software testing: black box testing and white box testing.

Black box Testing

Black box testing is a testing technique that ignores the internal mechanism of the system and focuses on the output generated against any input and execution of the system. It is also called functional testing.

White box Testing

White box testing is a testing technique that takes into account the internal mechanism of a system. It is also called structural testing and glass box testing. Black box testing is often used for validation and white box testing is often used for verification.

Types of testing

There are many types of testing like

- Unit Testing
- Integration Testing
- Functional Testing
- System Testing
- Stress Testing
- Performance Testing
- Usability Testing
- Acceptance Testing
- Regression Testing
- Beta Testing

Unit Testing

Unit testing is the testing of an individual unit or group of related units. It falls under the class of white box testing. It is often done by the programmer to test that the unit he/she has implemented is producing expected output against given input.

Integration Testing

Integration testing is testing in which a group of components are combined to produce output. Also, the interaction between software and hardware is tested in integration testing if software and hardware components have any relation. It may fall under both white box testing and black box testing.

Functional Testing

Functional testing is the testing to ensure that the specified functionality required in the system requirements works. It falls under the class of black box testing.

System Testing

System testing is the testing to ensure that by putting the software in different environments (e.g., Operating Systems) it still works. System testing is done with full system implementation and environment. It falls under the class of black box testing.

Stress Testing

Stress testing is the testing to evaluate how system behaves under unfavorable conditions. Testing is conducted at beyond limits of the specifications. It falls under the class of black box testing.

Performance Testing

Performance testing is the testing to assess the speed and effectiveness of the system and to make sure it is generating results within a specified time as in performance requirements. It falls under the class of black box testing.

Usability Testing

Usability testing is performed to the perspective of the client, to evaluate how the GUI is user-friendly? How easily can the client learn? After learning how to use, how proficiently can the client perform? How pleasing is it to use its design? This falls under the class of black box testing.

Acceptance Testing

Acceptance testing is often done by the customer to ensure that the delivered product meets the requirements and works as the customer expected. It falls under the class of black box testing.

Regression Testing

Regression testing is the testing after modification of a system, component, or a group of related units to ensure that the modification is working correctly and is not damaging or imposing other modules to produce unexpected results. It falls under the class of black box testing.

Chapter 6

Conclusion

In this paper, we make an attempt to automatically identify potential online users with SNMDs. We propose an SNMDD framework that explores various features from data logs of an OSN and a new tensor technique for deriving latent features from multiple OSNs for SNMD detection.

Future Work:

This work represents a collaborative effort between computer scientists and mental healthcare researchers to address emerging issues in SNMDs. As for the future work, we plan to study the features extracted from multimedia contents by techniques on NLP and computer vision. We also plan to further explore new issues from the perspective of a social network service provider, e.g., Facebook or Instagram, to improve the well-beings of OSN users without compromising user engagement.

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