

PERSONALITY PREDICTION THROUGH RESUME

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

by

A VIKAS (Reg.no.37110056)

K SATYA SAI (Reg. No. 37110361)



**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
SCHOOL OF COMPUTING**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

**Accredited with Grade "A" by NAAC
JEPPIAAR NAGAR, RAJIV GANDHI SALAI,
CHENNAI – 600 119**

MARCH - 2021



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)

Accredited with "A" grade by NAAC

Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai – 600 119

www.sathyabama.ac.in



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

This is to certify that this project report is the bonafide work of **ATLURI VIKAS(Reg. No. 37110056)** and **KONGARA SATYA SAI(Reg. No.37110361)** who carried out the project entitled "**PERSONALITY PREDICTION THROUGH RESUME**" under my supervision from **August 2020 to March 2021**.

Internal Guide
Dr. S. Murugan,M.E.,Ph.d.,

Head of the Department

Submitted for Viva voce Examination held on_____

Internal Examiner

External Examiner

DECLARATION

I **ATLURI VIKAS** here by declare that the Project Reportentitled “**PERSONALITY PREDICTION THROUGH RESUME**” is done by me under the guidance of **Dr. S. Murugan,M.E.,Ph.d.**, Department of Computer Science and Engineering at Sathyabama Institute of Science and Technology is submitted in partial fulfillmentof the requirements for the award of Bachelor of Engineering degree in ComputerScience and Engineering.

DATE:

PLACE: CHENNAI

SIGNATURE OF THE CANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management** of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T. Sasikala, M.E., Ph.D., Dean**, School of Computing, **Dr. S. Vigneswari, M.E., Ph.D.,** and **Dr. L. Lakshmanan, M.E., Ph.D., Heads of the Department** of Computer Science and Engineering for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide **Dr. S. Murugan, M.E., Ph.d., Professor**, for her valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Computer Science and Engineering** who were helpful in many ways for the completion of the project.

ABSTRACT

A recruitment process requires an eligibility check, an aptitude evaluation and a psychometric analysis of prospective candidates. The work puts forward an application where the system allows employers to post new job offerings and registered candidates can apply. The application estimates applicant's emotional aptitude through a psychometric analysis based on a test whereas the professional standard is verified via technical aptitude test. OCEAN Model is used to assess emotional quotient and predict the personality traits. Machine learning techniques such as Logistic Regression are used for modelling the personality predictor. The details of the candidates are kept secure by using a password encryption algorithm. The passwords are only known to the required individuals. The system outputs whether the candidate has been selected for the interview process via dashboard and SMS alerts. A list of candidates is generated for the employer in order to keep track of the shortlisted candidates along with their scores.

Keywords: Machine Learning, Password Encryption, Big Five Model, Recruitment, CV Analysis, Personality Prediction.

TABLE OF CONTENTS

ABSTRACT	v
LIST OF FIGURES	vii

CHAPTER No.	TITLE	PAGE No.
1.	INTRODUCTION	
	1.1 About the project	1
2.	SYSTEM ANALYSIS	
	2.1 Literature Survey	3
	2.2 Proposed system	4
3	REQUIREMENT SPECIFICATIONS	
	3.1 System Framework	6
	3.2 Hardware And Software Specification	6
	3.3 Technologies used	6
4	ARCHITECTURE	
	4.1 Architecture	8
	4.2 Proposed system architecture	9
	4.3 The Big Five Personality Model	10
	4.4 Security regime	11
5	DESIGN AND IMPLEMENTATION	
	5.1 Employee Grading Module	12
	5.2 Naïve Bayes	12
	5.3 Support Vector Regression	13
	5.4 Data set collection	14
	5.5 Result Analysis	14
	CONCLUSION	16
	SCREEN SHOTS	17
	SOURCE CODE	19
	REFERENCE	27

LIST OF FIGURES

FIGURE No.	FIGURE NAME	PAGE No.
1	Flow Chart	5
2	Big Five Model	8
3	Architecture Diagram	9
4	Data Set	14
5	Landing Page	17
6	Upload Resume and Details	17
7	Result Page	18
8	Command Line Outputs	18

CHAPTER 1

INTRODUCTION

1.1 About the project

Selection of candidates in a recruitment drive from a vast pool of candidates is a common issue. Traditional techniques consist organizing personality and technical aptitude tests, group discussions and interviews. With the advancement in technology, the way recruitments are being conducted has shifted. Knowledge Management Systems (Online Recruitment Systems) are used to employ candidates, by using the medium, Web 2.0 and various social media websites. Using social media as a tool here poses newer, powerful challenges and opportunities for employers. It also presents high efficiency, speed and attracts and targets specific, that is, relevant job applicants from the humongous number of candidates. [1]. A set of unique differences that are manipulated by the development of an individuals' personal memories, values, social relationships, attitude, skills and habits. Characteristics revealed in a certain pattern of behavior in a different bunch of situations form a personality trait. Finding an individual personality trait and intelligence from his or her face plays a crucial role in inter-personal relationships but it is non-reliable. Results show personality traits such as social interaction, capacity of mutual respect, creativity, and many other traits cannot be just estimated by personal interactions [2]. In this approach, the escalating social media data has been used in multiple methods composed from scratch.

A system proposed by Kessler et al. [12] separates applicants based on their relevance by analyzing unstructured text documents (job offers) and categorizes. Another XML-based multi-agent recommender system, proposed by Pasquale De Meo [13] uses rich user profiles for support. The proposed system was a multi-agent recommender system which used XML for exploiting user profiles to enhance recruitment services in a personalized manner.

Another approach proposed by Mohammad Mehrad Sadra et al. [3] uses NLP for standardizing resumes through a modelling language approach. Despite in great usage, these techniques have disparities related to structure, inconsistent CV formats and contextual information. Additionally, the applicants may show themselves in a well-behaved manner as an online questionnaire's responses can be manipulated for personality inference. Also, social networking sites contain data that is usually irrelevant for recruitment and thus shall not consist sufficient supplementary information regarding the candidate.

In this paper, a system is proposed, which automates the eligibility check and estimates the emotional intelligence by leveraging the potentials of the data found in the test scripts. Various attributes of the test are processed for evaluating the candidate's personality in the system. The professional eligibility of a candidate is checked based on the entries in the online CV submitted by the applicants. Credibility is assured from the mandatory declaration of the users and also resolves the standardization issue. The prime intention is the reduction in the time spent on the initial recruitment phases keeping the end-goal of making the procedure more effective at a higher stage. Overriding of the decision-making capabilities of employers does not take place by the system. Rather, the proposed system helps in removing the time-consuming phases and shortens the tedious process.

CHAPTER 2

SYSTEM ANALYSIS

2.1 LITERATURE SURVEY

In 2014 an Integrated E-Recruitment System for Automated Personality Mining and Applicant Ranking was proposed by Faliagka et al. an automated candidate ranking was implemented by this system. It was based on objective criteria that the candidate's details would be extracted from the candidate's LinkedIn profile. The candidates' personality traits were automatically extracted from their social presence using linguistic analysis. The candidate's rank was derived from individual selection criteria using Analytical Hierarchy Process (AHP), while their weight was controlled by the recruiter (admin). The limitations of the system were that senior positions that required expertise and certain qualifications were screened inconsistently [1].

Liden et al. published The General Factor of Personality: The interrelations among the Big Five personality factors (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) were analyzed in this paper to test for the existence of a GFP. The meta-analysis provides evidence for a GFP at the highest hierarchical level and that the GFP had a substantive component as it is related to supervisor-rated job performance were concluded by this paper. However, it is also realized that it is important to note that the existence of a GFP did not mean that other personality factors that were lower in the hierarchy lost their relevance [2].

Psychometric analysis is used for choosing the right candidate as per the outcome of psychometric test and need of an organization [5]. For psychometric analysis protocols were proposed in using the survey data of the Alberta Context Tool. Big Five Personality Model (also known as Five Factor Model) has been used to predict the personality of the candidate which includes Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism [2, 7]. For classifying the person Automated Personality Classification is used, which is used to classify the person from a large number of people [4]. Recommendation using machine learning techniques have been used for the analysis of the CV.

In literature, various evaluation tools have been used [4]. One of the approaches has been mentioned in which use a tool called "Career Mapper" for the recommendations of the

CV. It checks for the completeness of the user profile. The recommendation usually involves the use of various filters. Content and Collaboration are among them. One of the approaches of Content-Based Recommender is mentioned is which use Fo-DRA for the recommendation which is based on content [1]. Collaborative Based Recommender has a key function for the similarities among users [8, 9, 10]. Based on the above survey technique we state some of the limitations. 1. The impact of manual interviews and the resumes over HR has kept on increasing in recent years. It is very important to come up with a solution that can shorten or fasten the HR department work. Therefore a system has been implemented that recommends the candidates CV. 2. Traditional forms of recruitment typically involve job seekers filling out physical resumes and giving interviews with the surge in applicants lately, the number of candidates tends to overwhelm the employers. The proposed automated candidate grading system utilizes machine learning algorithms to build the models which test them. To overcome above limitations we propose our system as follows.

2.2 PROPOSED SYSTEM

we propose personality evaluation and CV analysis using machine learning algorithm. This system provides with an expert workforce for the organization which will help the HR department to select the right candidate for the particular job profile.

In our society intelligence is highly appreciated. If you have a high IQ, you have a better chance of being successful at school and professional life. Generally, for prediction of personality, psychometric questions are used.

The proposed system is developed as a web application wherein the admin is first needed to login with proper credentials followed by which they can add the questions and can also modify them. For each question, four options along with the correct answer is stored in the database. The candidate will register her/himself with all the details and will also fill their own CV details into the system.

Sample aptitude test questions along with their options are shown in (Table 1). After the test given by the candidates, the scores are stored in databases. The next test is of personality test. There is a common myth which says that IQ tests measure intelligence. What an IQ test actually measures is not actual intelligence, but a person's capacity for intelligence. In this test various situations will be encountered by the candidate ranging from strongly agree to disagree, which is provided as a drop-down list. The factors range like openness to experience, conscientiousness. (Table 2) shows the sample

questions for personality test. Each question has the fix set of choices varying from strongly agree to disagree. The proposed system is developed on the basis of the implementation steps shown in (Figure 1).

The candidate has to undergo the registration and login process, then they can create their profile along with CV. Followed by this process, a candidate can give tests to get scores. The TF-IDF algorithm is used to perform the analysis as a graph in terms of the programming skills on x-axis and the respective scores on y-axis. These scores will help recruiters in selecting the right candidate. In the next section, we present architectural overview of our system.

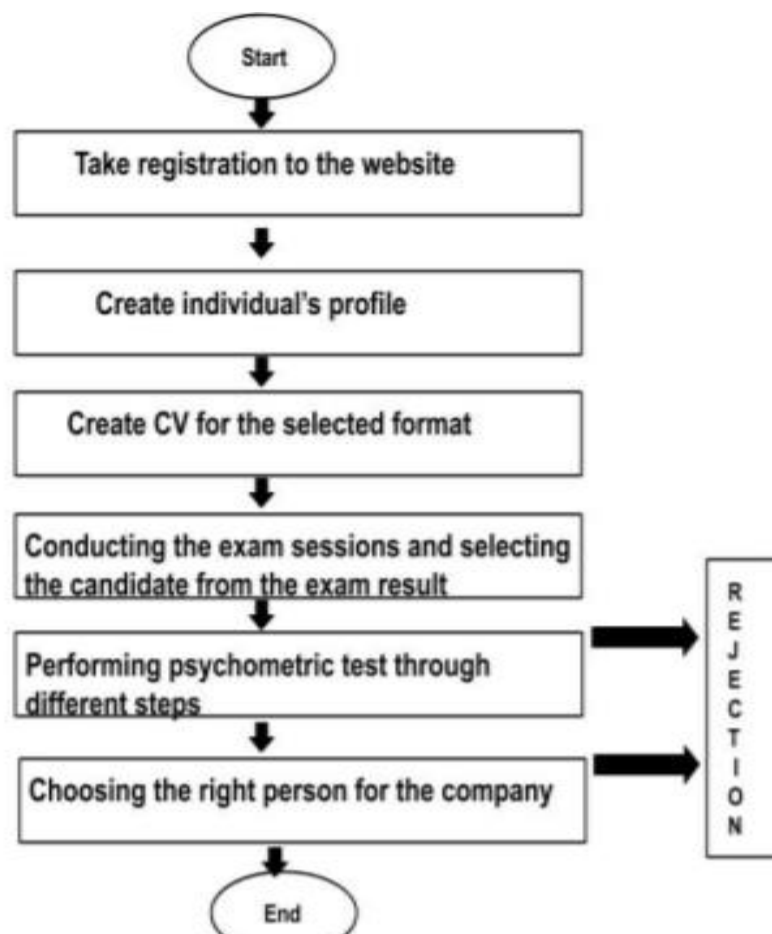


Fig 1

CHAPTER 3

REQUIREMENT SPECIFICATIONS

3.1 SYSTEM FRAMEWORK

The system built consists of three prime components, which are:

Job Application Component: Registration by submitting online CV and extraction of required information and then performing an eligibility check with respect to the job description of the position being offered.

Evaluation Component: Estimation of the emotional and technical aptitude of the user by evaluating the test scripts. The standard used to mine the personality traits is OCEAN.

Applicants Grading Component: Combines the personality assessment and the eligibility criteria from the evaluation component for assigning a relevant score. Ranking is on the basis of the relevant scores and this function is extracted from supervised algorithms.

3.2 HARDWARE AND SOFTWARE SPECIFICATION

3.2.1 HARDWARE REQUIREMENTS

- Hard disk : 500 GB and above.
- Processor : i3 and above.
- Ram : 4GB and above.
- Webcam

3.2.1 SOFTWARE REQUIREMENTS

- Operating System : Windows 7 and above (64-bit).
- Python : 3.6

3.3 TECHNOLOGIES USED

- Python
- Convolution Neural Network (CNN)

CONVOLUTIONAL NEURAL NETWORKS (CNN)

INTRODUCTION

Convolutional neural networks (CNN) sound like a weird combination of biology and math with a little CS sprinkled in, but these networks have been some of the most influential innovations in the field of computer vision. 2012 was the first year that neural nets grew to prominence as Alex Krizhevsky used them to win that year's ImageNet competition (basically, the annual Olympics of computer vision), dropping the classification error record from 26% to 15%, an astounding improvement at the time. Ever since then, a host of companies have been using deep learning at the core of their services. Facebook uses neural nets for their automatic tagging algorithms, Google for their photo search, Amazon for their product recommendations, Pinterest for their home feed personalization, and Instagram for their search infrastructure.

However, the classic, and arguably most popular, use case of these networks is for image processing. Within image processing, let's take a look at how to use these CNNs for image classification.

CHAPTER 4

ARCHITECTURE

4.1 ARCHITECTURE

The never-ending amount of applications in traditional hiring tend to stun in-charges of selecting personnel. Meticulous parameterization is required by the HR department's expert members for the efficient working of existing automated grading systems. Change in criteria of hiring can make this a cumbersome and error prone technique. Candidate ranking models in the proposed system utilize Machine Learning algorithms (Logistic Regression). It involves ample amount of input training data for model training consisting of previous candidate decision data.

As in Figure 1, an eligibility check is performed by the candidate evaluator system, based on the entries in the online CV. This enables the HR infrastructure to be associated to the system for further commercial use.



Fig 2

Figure 1. Big Five Model [1]

The main concerns here would be:

Professional Experience: It tallies the requirement mentioned by the recruiters and the candidate's previous work experience.

Education: Courses perceived along their education period and the scores.

Loyalty Index: Number of years spent on an average in the prior jobs.

Co-curricular Activities: The hobbies and other activities help in the psychometric

analysis of the candidate.

The qualifications claimed including the estimated eligibility scores are stored in the database. The top candidates are shortlisted for interviews and the further process is handled manually.

4.2 PROPOSED SYSTEM ARCHITECTURE

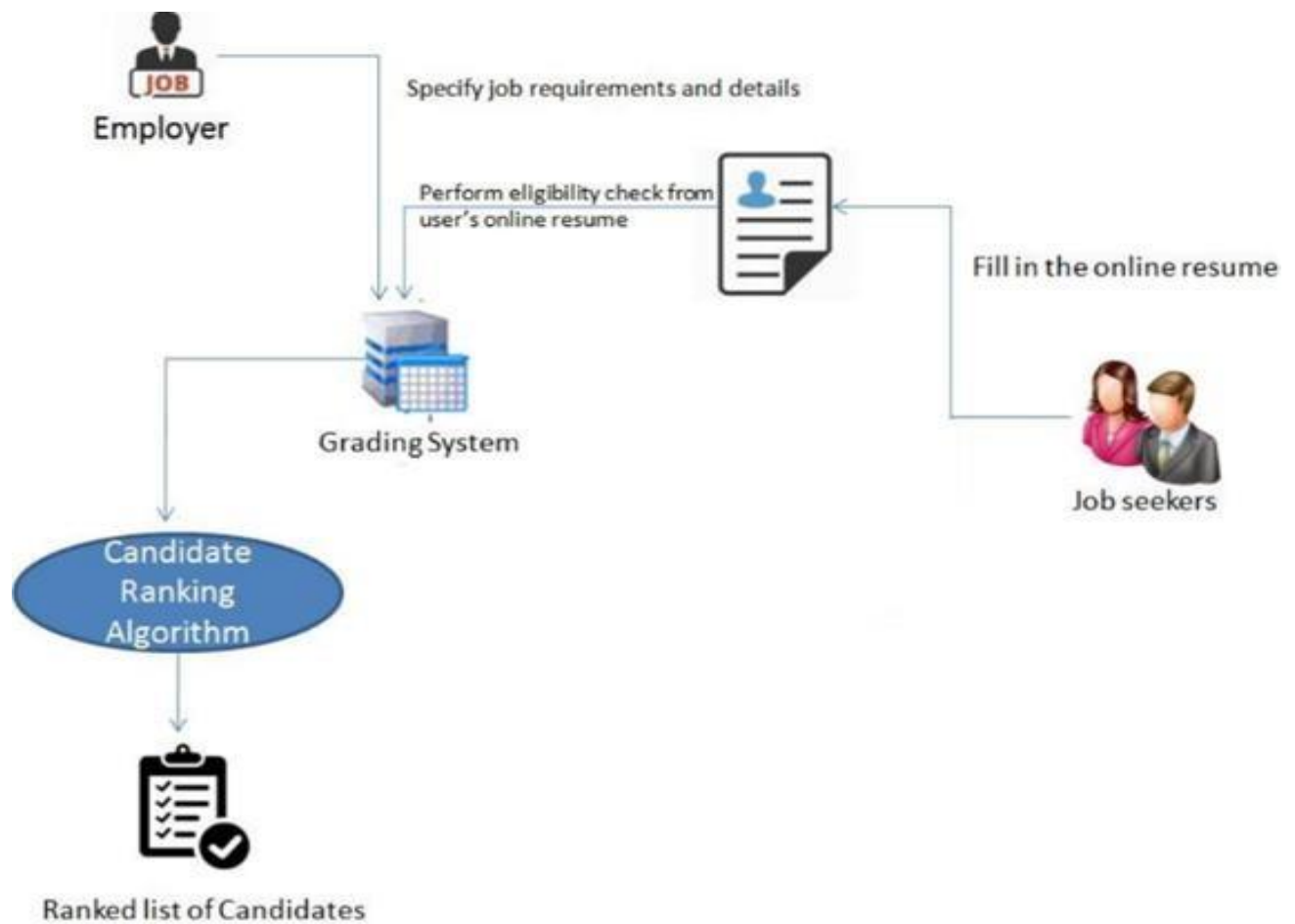


Fig 3 proposed system architecture

4.3 The Big Five Personality Model

Personality attributes of an individual are reflected in the way people present themselves on social networking platforms. The Five-Factor Model (FFM) uses such information for segregation into OCEAN traits, classifications which can be eventually utilized by other respective teams. Allegedly, deeper knowledge of personality data to extract specific information continues to be a hot research topic. The OCEAN model checks for the personality on the basis of agreeableness, openness, extraversion, conscientiousness and neuroticism. Although FFM is used vastly, it poses certain issues.

Prediction and classification of individuals based on behavior is a research area and FFM(OCEAN) is frequently used. Complexity due to different interpretations is one of the challenges proposed [4]. The factors are explained below [1]:

Openness to experiences shows the degree of intellectual curiosity for creativity and acceptance of new ideology and liking for variety and novelty. High levels show novelty seeking and broad interests, while low levels say preference for conventionality and familiarity (data driven and expedient).

Conscientiousness is for people who are organized, disciplined, meticulous and punctual. Low level is perceived as spontaneous and flexible, but can be unreliable and tawdry. High level is seen as obsessive and stubborn.

Extroversion is for amicable, adventurous and talkative people while introversion is for reserved and timid ones.

Agreeableness shows friendly nature, trusting and how helpful a person is. Low levels suggest competitiveness while high levels show submissive or naïve nature.

Neuroticism judge emotions handling ability. Low levels show better grip on one's emotions whereas high levels show sensitivity and anxiety.

4.4 Security regime

The proposed system uses its own password encryption algorithm. When the user registers, the password is sent to the database after encryption. The encryption algorithm is a function which accepts a string parameter. The function consists of a complex combination of Pre-order, In-order and Post-order traversals of a Binary Search Tree (BST) consisting of cryptic combination of the string entered. The function returns a string which is then stored in the database. Thus, this function almost makes it impossible to decipher thus taking the data out of harm. Another specialty of this algorithm is that whatever is the length of the password, the database will store the password of a specific length only, i.e. all the passwords in the database will be of the same length. The proposed system has used a security regime as the data of the employers as well as the job seekers is sensitive and should not be exposed and used for any for any undesirable reasons.

Properties

- a) Deterministic – Always fixed length of output
- b) Fast – This uses binary search trees and hence are very fast
- c) Irreversible – Can't be decrypted
- d) Collision-Resistant – Difficult to find two strings that produce same encrypted password

From the mentioned properties, it can be assumed that the algorithm works similar to the SHA-1 algorithm.

Takeaways

- a) Pre-image Resistance – If the encrypted password is given and the algorithm is also given, it is difficult to find the input string
- b) Second Pre-image Resistance – If the input string, algorithm and the encrypted password is given, it is difficult to find another input string that will give the same encrypted password
- c) Unbreakable without using Brute Force Approach
- d) One-way

CHAPTER 5

DESIGN AND IMPLEMENTATION

5.1 Employee Grading Module

Generally, recruitment drives have job seeking candidates handing in physical resumes and employers checking the credentials. As outpour of applicants has increased recently, the amount of proposed CVs astounded the recruiters. Machine learning (ML) algorithms are used to build the results of the entire process until the interview phase. It requires a certain amount of input training data, which primarily consists of candidate selection decisions of previous candidates apportioned by experts in the field [1]. Eligibility scores generated for the analysis describes the candidate's fitness for the job. The analysis features are saved as Boolean variables (an emotional assessment) or as numerical values (work experience). A learning algorithm is fed with the data that constructs the assessment when the candidate's stated features are passed as input. The system, finally, generates the final ranked list to sort out the candidates [6] [7]. Suggested work shows the training data set as a set of input employee selection patterns. The work is sufficiently performed by the employee grading procedure and the evaluation tests using learning to rank algorithms such as Naïve Bayes and Support Vector Regression (SVR).

5.2 Naïve Bayes

In classification issues, the hypothesis could be assigning the class for a new data instance whereas in ML, a person selects the best hypothesis and data. Bayes' Theorem provides an easy way of choosing the most probable hypothesis given data which can be used as prior knowledge, using which they can calculate the probability.

Bayes' Theorem is stated as:

$$P(h|d) = (P(d|h) * P(h))/P(d)$$

where,

$P(h)$ - prior probability of h $P(d)$

- probability of the data

$P(h|d)$ - posterior probability

$P(d|h)$ - probability of data d given that the hypothesis h is true.

Selection of the hypothesis with the highest probability which is the Maximum a Posteriori (MAP) hypothesis can be done after finding various posterior probabilities for a variety of hypotheses. This can be written as:

$$\text{MAP}(h) = \max (P(h|d))$$

or

$$\text{MAP}(h) = \max ((P(d|h) * P(h))/P(d))$$

or

$$\text{MAP}(h) = \max (P(d|h) * P(h))$$

In case of classification, the probability of each class (e.g. $P(h)$) will be equal if training data consists of an even number of instances in each class and it ends up with:

$$\text{MAP}(h) = \max (P(d|h))$$

5.3 Support Vector Regression

A set of methods for supervised learning called Support Vector Machines (SVMs) can be applied to both regression and classification problems. One of the major power sources for SVMs is nonlinear mapping of input space to a higher dimensional feature space in the kernel representation. Their objective is to discover a function that affects the data's integral of a certain loss function and its unknown probability distribution. The empirical risk by which the original (undecided yet) one and the estimated function differs is reduced [10].

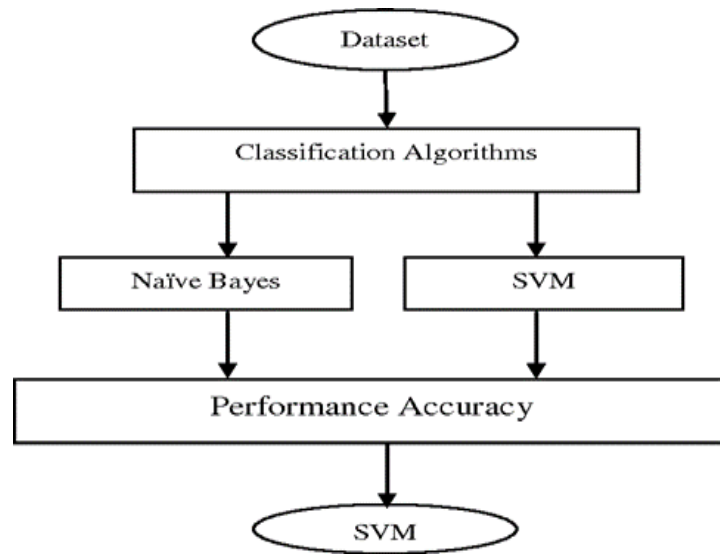


Fig 4

5.4 Data set collection

The data set collection was done through a lot of websites and personal interactions with job seekers. The questions and responses were recorded and stored in a CSV file for easy data training and retrieval. The data set can be stored in any form: XML, JSON, etc.

5.5 Result Analysis

From studies on proposed system, Table I was derived. Previous implemented studies using Naïve Bayes and Support Vector regression algorithms showed a higher coefficient of correlation. Thus, the system has improved accuracy than the existing system to a certain extent i.e. a decrease of 0.02 and 0.07 has been observed for Logistic Regression and SVR respectively.

The password encryption algorithm adopted here, was successfully implemented to store the password of the registered candidates and proved to provide a good security cover. The encryption process took a little longer time delaying the working the training of the system by a few minutes.

Table 1. Eligibility Score of Different Regression Algorithms and their Correlation Coefficients

Job Position	Coefficient of Correlation	
	Logistic Regression	Support Vector Regression
Associate Programmer	0.63	0.65
Senior Manager	0.62	0.69

CONCLUSION

In the work presented, an efficient and effective approach is used to rank and evaluate candidates through psychometric analysis for calculating emotional quotient. Technical eligibility criteria from the online CVs and emotional aptitude by leveraging responses in evaluations are processed by the proposed system. The OCEAN model performs the linguistic and personality analysis of the candidates. 65% and 87% average accuracy levels were obtained by the algorithm dependent and independent approaches respectively. The accuracy obtained by the proposed system is higher than the previously implemented systems which had 45% average accuracy levels by the algorithm dependent approach. The Tree XI algorithm created is adding an extra layer of security to the existing ones. There is also scope for improvement in the algorithm as currently it can't handle larger lengths of input data. Employee grading process uses supervised algorithms which are trained with previous recruitment data. The future scope of the project could be to add a video and image processing elements. Also, the CV standardization issue can be dealt with by uploading CVs in a certain format. This would increase the efficiency of a system by a certain level.

SCREEN SHOTS

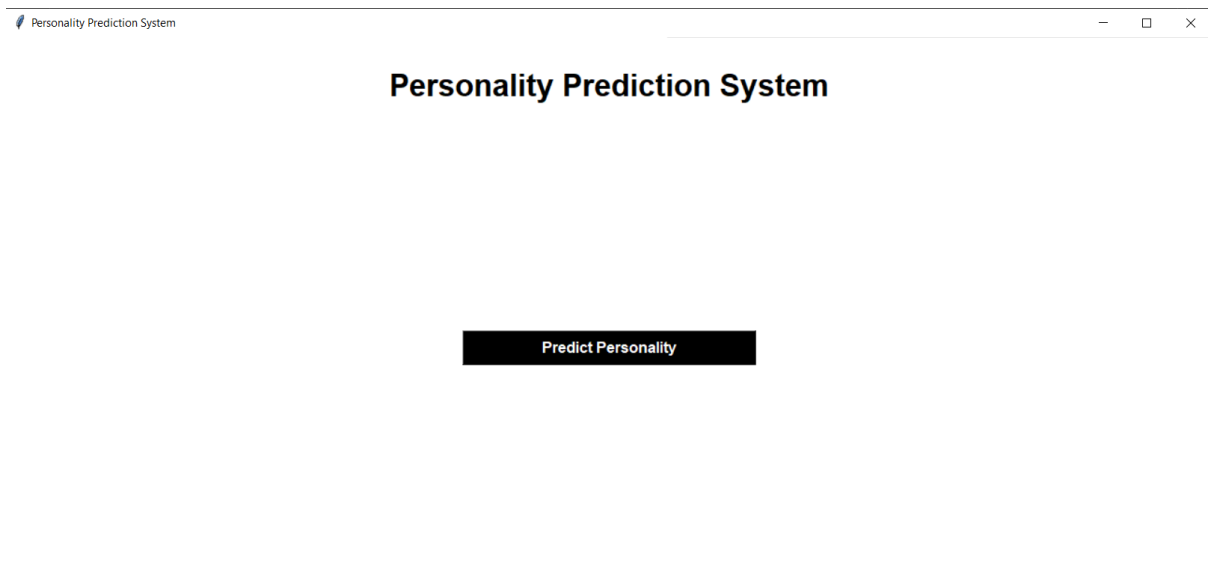


Fig 5 Landing Page

A screenshot of a web browser window titled "Apply For A Job". The page has a black background with the title "Personality Prediction" in red text at the top center. Below the title, there is a form with the following fields and labels: "Applicant Name" (text input), "Age" (text input), "Gender" (radio buttons for "Male" and "Female", with "Female" selected), "Upload Resume" (a "Select File" button), "Enjoy New Experience or thing(Openness)" (text input with "1-10" placeholder), "How Offen You Feel Negativity(Neuroticism)" (text input with "1-10" placeholder), "Wishing to do one's work well and thoroughly(Conscientiousness)" (text input with "1-10" placeholder), "How much would you like work with your peers(Agreeableness)" (text input with "1-10" placeholder), and "How outgoing and social interaction you like(Extraversion)" (text input with "1-10" placeholder). At the bottom right of the form is a red "Submit" button.

Fig 6 Upload Resume and Details

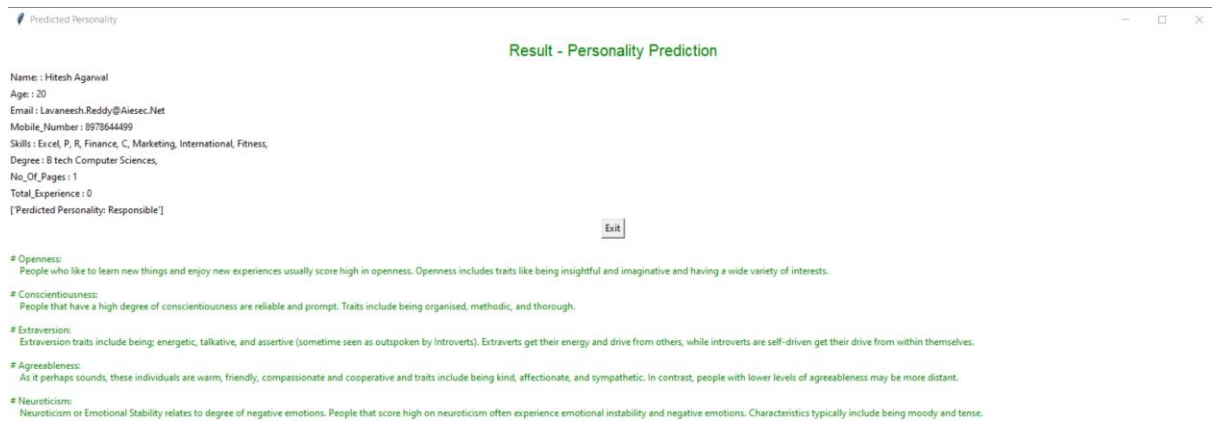


Fig 7 Result page

```
C:\Users\hites\Desktop\Personality Prediction through CV>python main.py

##### Candidate Entered Data #####

('Candidate Name': 'Hitesh Agarwal', 'CV Location': 'C:/Users/hites/Desktop/Personality Prediction through CV/Test Cases/resume3.pdf') (1, '20', '2', '2', '2', '2', '3')

##### Predicted Personality #####

['responsible']

##### Resume Parsed Data #####

email : hitesh.11808798@lpu.in
mobile_number : 9991636719
skills : ['C', 'Php', 'Mobile', 'C++', 'Python', 'Css', 'Training', 'Java', 'Electrical', 'Technical', 'Research', 'Javascript', 'Html', 'Email', 'Programming', 'Automation', 'System', 'Github', 'Rocket']
degree : ['B. Tech (CSE)']
designation : ['HOME AUTOMATION USING GOOGLE ASSISTANT', 'Medical Assistant', 'Technical Head']
company_names : ['appliance using Google Assistant on mobile']
no_of_pages : 3
total_experience : 0
```

Fig 8 Command Line Outputs

SOURCE CODE

Import Libraries

```
import os
import pandas as pd
import numpy as np
from tkinter import *
from tkinter import filedialog
import tkinter.font as font
from functools import partial
from pyresparser import ResumeParser
from sklearn import datasets, linear_model

class train_model:

    def train(self):
        data =pd.read_csv('training_dataset.csv')
        array = data.values

        for i in range(len(array)):
            if array[i][0]=="Male":
                array[i][0]=1
            else:
                array[i][0]=0

        df=pd.DataFrame(array)

        maindf =df[[0,1,2,3,4,5,6]]
        mainarray=maindf.values

        temp=df[7]
        train_y =temp.values

        self.mul_lr =
linear_model.LogisticRegression(multi_class='multinomial',
```

```

solver='newton-cg',max_iter =1000)
    self.mul_lr.fit(mainarray, train_y)

def test(self, test_data):
    try:
        test_predict=list()
        for i in test_data:
            test_predict.append(int(i))
        y_pred = self.mul_lr.predict([test_predict])
        return y_pred
    except:
        print("All Factors For Finding Personality Not Entered!")

def check_type(data):
    if type(data)==str or type(data)==str:
        return str(data).title()
    if type(data)==list or type(data)==tuple:
        str_list=""
        for i,item in enumerate(data):
            str_list+=item+", "
        return str_list
    else:  return str(data)

def prediction_result(top, aplcnt_name, cv_path, personality_values):
    "after applying a job"
    top.withdraw()
    applicant_data={"Candidate Name":aplcnt_name.get(), "CV
    Location":cv_path}

    age = personality_values[1]

    print("\n##### Candidate Entered Data #####\n")
    print(applicant_data, personality_values)

    personality = model.test(personality_values)
    print("\n##### Predicted Personality #####\n")

```

```

print(personality)
data = ResumeParser(cv_path).get_extracted_data()

try:
    del data['name']
    if len(data['mobile_number'])<10:
        del data['mobile_number']
except:
    pass

print("\n##### Resume Parsed Data #####\n")

for key in data.keys():
    if data[key] is not None:
        print('{} : {}'.format(key,data[key]))

result=Tk()
# result.geometry('700x550')
result.overrideredirect(False)
result.geometry("{}x{}+0+0".format(result.winfo_screenwidth(),
result.winfo_screenheight()))
result.configure(background='White')
result.title("Predicted Personality")

#Title
titleFont = font.Font(family='Arial', size=40, weight='bold')
Label(result, text="Result - Personality Prediction", foreground='green',
bg='white', font=titleFont, pady=10, anchor=CENTER).pack(fill=BOTH)

Label(result, text = str('{} : {}'.format("Name:",
aplcnt_name.get()))).title(), foreground='black', bg='white',
anchor='w').pack(fill=BOTH)

Label(result, text = str('{} : {}'.format("Age:", age)),
foreground='black', bg='white', anchor='w').pack(fill=BOTH)

for key in data.keys():
    if data[key] is not None:
        Label(result, text = str('{} :

```

```
{ }'.format(check_type(key.title()),check_type(data[key]))),
foreground='black', bg='white', anchor='w', width=60).pack(fill=BOTH)
    Label(result, text = str("predicted personality: "+personality).title(),
foreground='black', bg='white', anchor='w').pack(fill=BOTH)
```

```
quitBtn = Button(result, text="Exit", command =lambda:
result.destroy()).pack()
```

```
terms_mean = ""
```

Openness:

People who like to learn new things and enjoy new experiences usually score high in openness. Openness includes traits like being insightful and imaginative and having a wide variety of interests.

Conscientiousness:

People that have a high degree of conscientiousness are reliable and prompt. Traits include being organised, methodic, and thorough.

Extraversion:

Extraversion traits include being; energetic, talkative, and assertive (sometime seen as outspoken by Introverts). Extraverts get their energy and drive from others, while introverts are self-driven get their drive from within themselves.

Agreeableness:

As it perhaps sounds, these individuals are warm, friendly, compassionate and cooperative and traits include being kind, affectionate, and sympathetic. In contrast, people with lower levels of agreeableness may be more distant.

Neuroticism:

Neuroticism or Emotional Stability relates to degree of negative

emotions. People that score high on neuroticism often experience emotional instability and negative emotions. Characteristics typically include being moody and tense.

"""

```
Label(result, text = terms_mean, foreground='green', bg='white',  
anchor='w', justify=LEFT).pack(fill=BOTH)
```

```
result.mainloop()
```

```
def predict_person():
```

```
    """Predict Personality"""
```

```
    # Closing The Previous Window
```

```
    root.withdraw()
```

```
    # Creating new window
```

```
    top = Toplevel()
```

```
    top.geometry('700x500')
```

```
    top.configure(background='black')
```

```
    top.title("Apply For A Job")
```

```
    #Title
```

```
    titleFont = font.Font(family='Helvetica', size=20, weight='bold')
```

```
    lab=Label(top, text="Personality Prediction", foreground='red',  
bg='black', font=titleFont, pady=10).pack()
```

```
    #Job_Form
```

```
    job_list=('Select Job', '101-Developer at TTC', '102-Chef at Taj', '103-  
Professor at MIT')
```

```

job = StringVar(top)
job.set(job_list[0])

l1=Label(top, text="Applicant Name", foreground='white',
bg='black').place(x=70, y=130)
l2=Label(top, text="Age", foreground='white', bg='black').place(x=70,
y=160)
l3=Label(top, text="Gender", foreground='white',
bg='black').place(x=70, y=190)
l4=Label(top, text="Upload Resume", foreground='white',
bg='black').place(x=70, y=220)
l5=Label(top, text="Enjoy New Experience or thing(Openness)",
foreground='white', bg='black').place(x=70, y=250)
l6=Label(top, text="How Often You Feel Negativity(Neuroticism)",
foreground='white', bg='black').place(x=70, y=280)
l7=Label(top, text="Wishing to do one's work well and
thoroughly(Conscientiousness)", foreground='white',
bg='black').place(x=70, y=310)
l8=Label(top, text="How much would you like work with your
peers(Agreeableness)", foreground='white', bg='black').place(x=70,
y=340)
l9=Label(top, text="How outgoing and social interaction you
like(Extraversion)", foreground='white', bg='black').place(x=70, y=370)

sName=Entry(top)
sName.place(x=450, y=130, width=160)
age=Entry(top)
age.place(x=450, y=160, width=160)
gender = IntVar()
R1 = Radiobutton(top, text="Male", variable=gender, value=1, padx=7)
R1.place(x=450, y=190)
R2 = Radiobutton(top, text="Female", variable=gender, value=0,
padx=3)
R2.place(x=540, y=190)
cv=Button(top, text="Select File", command=lambda: OpenFile(cv))
cv.place(x=450, y=220, width=160)
openness=Entry(top)
openness.insert(0,'1-10')

```

```

openness.place(x=450, y=250, width=160)
neuroticism=Entry(top)
neuroticism.insert(0,'1-10')
neuroticism.place(x=450, y=280, width=160)
conscientiousness=Entry(top)
conscientiousness.insert(0,'1-10')
conscientiousness.place(x=450, y=310, width=160)
agreeableness=Entry(top)
agreeableness.insert(0,'1-10')
agreeableness.place(x=450, y=340, width=160)
extraversion=Entry(top)
extraversion.insert(0,'1-10')
extraversion.place(x=450, y=370, width=160)

submitBtn=Button(top, padx=2, pady=0, text="Submit", bd=0,
foreground='white', bg='red', font=(12))
submitBtn.config(command=lambda:
prediction_result(top,sName,loc,(gender.get(),age.get(),openness.get(),neu
roticism.get(),conscientiousness.get(),agreeableness.get(),extraversion.get
()))
submitBtn.place(x=350, y=400, width=200)

top.mainloop()

def OpenFile(b4):
    global loc;
    name =
filedialog.askopenfilename(initialdir="C:/Users/Batman/Documents/Progr
amming/tkinter/",
                            filetypes
                            =(("Document", "*.docx*"), ("PDF", "*.pdf*"), ('All files', '*')),
                            title = "Choose a file."
                            )
    try:
        filename=os.path.basename(name)
        loc=name

```

```

except:
    filename=name
    loc=name
b4.config(text=filename)
return

if __name__ == "__main__":
    model = train_model()
    model.train()

    root = Tk()
    root.geometry('700x500')
    root.configure(background='white')
    root.title("Personality Prediction System")
    titleFont = font.Font(family='Helvetica', size=25, weight='bold')
    homeBtnFont = font.Font(size=12, weight='bold')
    lab=Label(root, text="Personality Prediction System", bg='white',
font=titleFont, pady=30).pack()
    b2=Button(root, padx=4, pady=4, width=30, text="Predict Personality",
bg='black', foreground='white', bd=1, font=homeBtnFont,
command=perdict_person).place(relx=0.5, rely=0.5, anchor=CENTER)
root.mainloop()

```

REFERENCES

- [1] Vishnu M. Menon and Rahulnath H A, “A Novel Approach to Evaluate and Rank Candidates in a Recruitment Process by Estimating Emotional Intelligence through Social Media Data“, IEEE International Conference on Next Generation Intelligent Systems (ICNGIS), Kottayam, India **(2016)**, Sept. 1-3.
- [2] Gayatri Vaidya, Pratima Yadav, Reena Yadav, Prof. Chandana Nighut, “Personality Prediction by Discrete Methodology”, IOSR Journal of Engineering, vol. 14 **(2018)**, pp 10-13.
- [3] Mohammad Mehrad Sadra, ”The Role of Personality Traits Predicting Emotion Regulation Strategies”, International Academic Journal of Humanities, vol. 3, no 4, **(2016)**, pp. 13-24.
- [4] Muhammad Fahim Uddin, Jeongkyu Lee, “Proposing Stochastic Probability-based Math Model and Algorithms Utilizing Social Networking and Academic Data for Good Fit Students Prediction”, Social Network Analysis and Mining, vol. 7, no. 1, **(2017)**, pp. 7-29.
- [5] <https://medium.com/omarelgabrys-blog/binary-search-trees-598b657a779b>
- [6] Iftekhar Naim, M. Iftekhar Tanveer, Daniel Gildea and Mohammed (Ehsan) Hoque, “Automated Analysis and Prediction of Job Interview Performance”, IEEE Transactions on Affective Computing, vol. 9 no. 2 **(2018)**, pp. 191-204.
- [7] Muhammad Fahim Uddin, Soumita Banerjee, Jeongkyu Lee, “Recommender System Framework for Academic Choices: Personality Based Recommendation Engine (PBRE)”, IEEE 17th International Conference on Information Reuse and Integration (IRI), Pittsburgh, PA, USA **(2016)**, July 28-30.
- [8] Carolyn Winslow, Xiaoxiao Hu, Seth Kaplan, Yi Li, “Accentuate the Positive: Which Discrete Positive Emotions Predict Which Work Outcomes?”, The Psychologist-Manager Journal vol. 20, no. 2 **(2017)**, pp. 74-89.