Personality Prediction with Social Networks

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Overview

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Introduction

- What is personality?

  - "The combination of characteristics or qualities that form an individual's distinctive character" - google

  - "Personality is the particular combination of emotional, attitudinal, and behavioral response patterns of an individual" - wikipedia

  - Personality is usually broken into components called the **Big Five**, which are also known as **personality traits**. These components are generally stable over time and appear to be attributable to a person's genetics rather than the effects of one's environment.

Personality Traits

- **Neuroticism**

  - Related to emotional instability, represents the tendency to experience negative emotions and a lower tolerance to stress.

- **Extraversion**

  - An individual's preference for outgoing social experiences, while the opposite(introversion) is a desire for a lower level of social involvement.

- **Openness**

  - An individual's curiosity and appreciation for new experiences; the converse would be a greater respect for traditional and well-traveled experiences.

- **Agreeableness**

  - A tendency towards compassion and cooperation.

- **Conscientiousness**

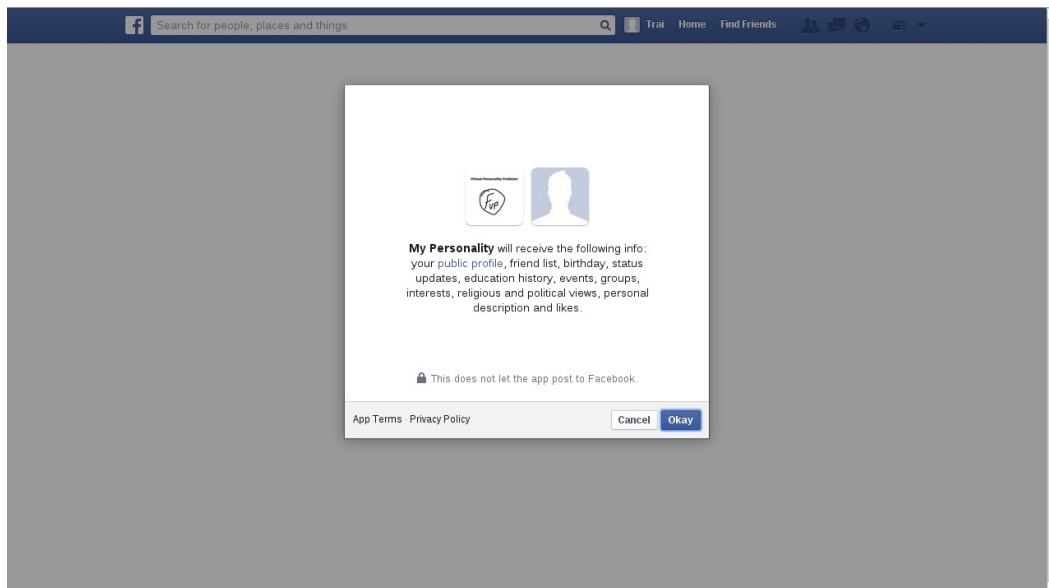 - Shows an individuals' self-discipline and devotion to duty;

Working method

1. Develop a questionnaire to decide the values actual personality traits of facebook users. This questionnaire also requests user to grant permission to access facebook profile/activities.

2. Extract possible features from facebook profile/activities of individuals.

3. Train a neural network using extracted features as input and actual values of personality traits as target outputs.

4. Perform necessary tests to evaluate the performance of system.

5. Now the system can be used to predict the personality trait values of previously unseen data.

Experimental Setup

- Questionnaire used for data collection
  - Gold Berg's 44 question BigFive inventory
  - Answer of each question can be as follows
    - Strongly Agree
    - Agree
    - Neither Agree Nor Disagree
    - Disagree
    - Strongly Disagree
  - At the beginning of questionnaire, a request is made for granting the permissions required for accessing user's facebook profile/activities.
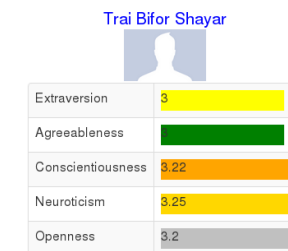
Few screen shots of questionnaire.

Personality Test

Disclaimer: This test is developed for the purpose of data collection of the project named 'Personality Prediction Using Social Media'. At the beginning you will be asked to grant the permission to access the your sharings in facebook. Please grant it.

Start Test

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Personality Test

Welcome Trai Bifor Shayar

S.No	Question (I consider myself as one who ....)	Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly
34	remains calm in tense situations?	●	○	○	○	○
35	prefers work that is routine?	○	●	○	○	○
36	is outgoing, sociable?	○	○	●	○	○
37	is sometimes rude to others?	○	○	○	●	○
38	make plans and follows through with them?	○	○	○	○	●
39	get nervous easily?	○	○	○	●	○
40	likes to reflect, play with ideas?	○	○	●	○	○
41	has few artistic interests?	○	●	○	○	○
42	like to cooperate with others?	●	○	○	○	○
43	is easily distracted?	○	●	○	○	○
44	is sophisticated in art, music, or literature?	○	○	◉	○	○

submit

Personality Test

Trai Bifor Shayar

Extraversion	3
Agreeableness	
Conscientiousness	3.22
Neuroticism	3.25
Openness	3.2

You may find significance of these features here

Thanks for your cooperation. We will be back soon

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Feature Extraction

- Following features were extracted.
  - Basic statistical details. (Number of groups, Number of page likes ..etc)   8
  - Category wise fraction of page likes   160
  - Linguistic features   10
  - **Total 178**

Construction and training of neural network

- Python library named 'pybrain' is used for construction and training of neural network.

- Neural network consists of 178 inputs, 5 outputs and 6 hidden layers.

- Neural network was trained until error converges to a limit or a maximum of 1000 epochs.

Structure of Neural Network
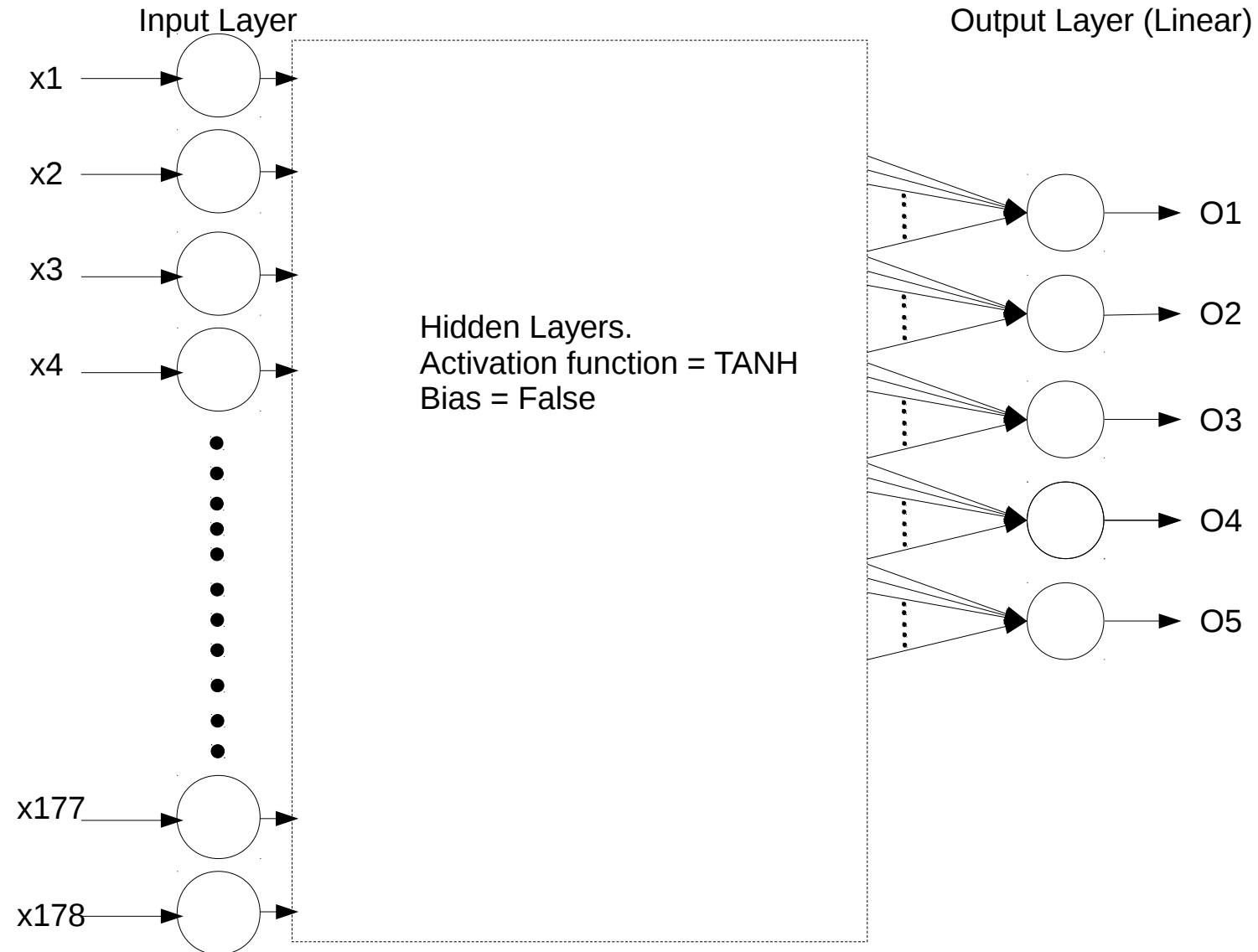
Sample Experiment

- Number of training tuples 16

- Number of test tuples 4

- Number of hidden layers 6

Sample Test Case 1

Shadab Khan

Traits	Predicted	Actual	Error
Extraversion	3.03	3.50	11.74 %
Agreeableness	3.57	3.67	2.43 %
Conscientiousness	3.27	2.00	31.76 %
Neuroticism	2.32	2.25	1.75 %
Openness.	3.422	4.30	21.94 %

Maximum Error	31.76 %
Average Error	18.93 %

Sample Test Case 2

Yawar Siddiqui

Traits	Predicted	Actual	Error
Extraversion	3.21	2.0	30.29 %
Agreeableness	3.52	4.33	20.18 %
Conscientiousness	2.78	2.67	2.84 %
Neuroticism	3.32	3.0	8.04 %
Openness.	3.29	3.3	0.33 %

Maximum Error	30.29 %
Average Error	12.34 %

Sample Test Case 3

Adil Ansar

Traits	Predicted	Actual	Error
Extraversion	3.35	1.87	36.98 %
Agreeableness	3.26	4.22	23.82 %
Conscientiousness	2.55	3.0	11.16 %
Neuroticism	2.62	4.12	37.42 %
Openness.	3.06	3.3	6.04 %

Maximum Error	37.42 %
Average Error	23.08 %

Aashisha Chakraborty
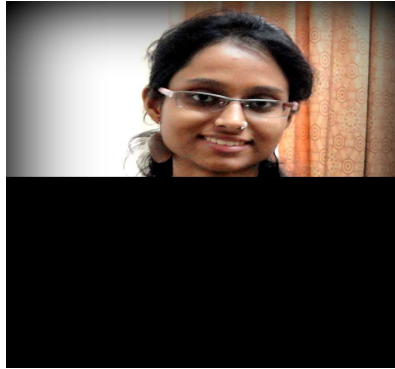
Traits	Predicted	Actual	Error
Extraversion	3.37	2.25	28.08 %
Agreeableness	3.03	4.67	40.79 %
Conscientiousness	3.08	3.55	11.94 %
Neuroticism	2.50	3.37	21.76 %
Openness.	3.79	3.8	0.04 %

Maximum Error	40.79 %
Average Error	20.522 %

Test Result

Random Subset Sampling (Number of training samples vs Accuracy)
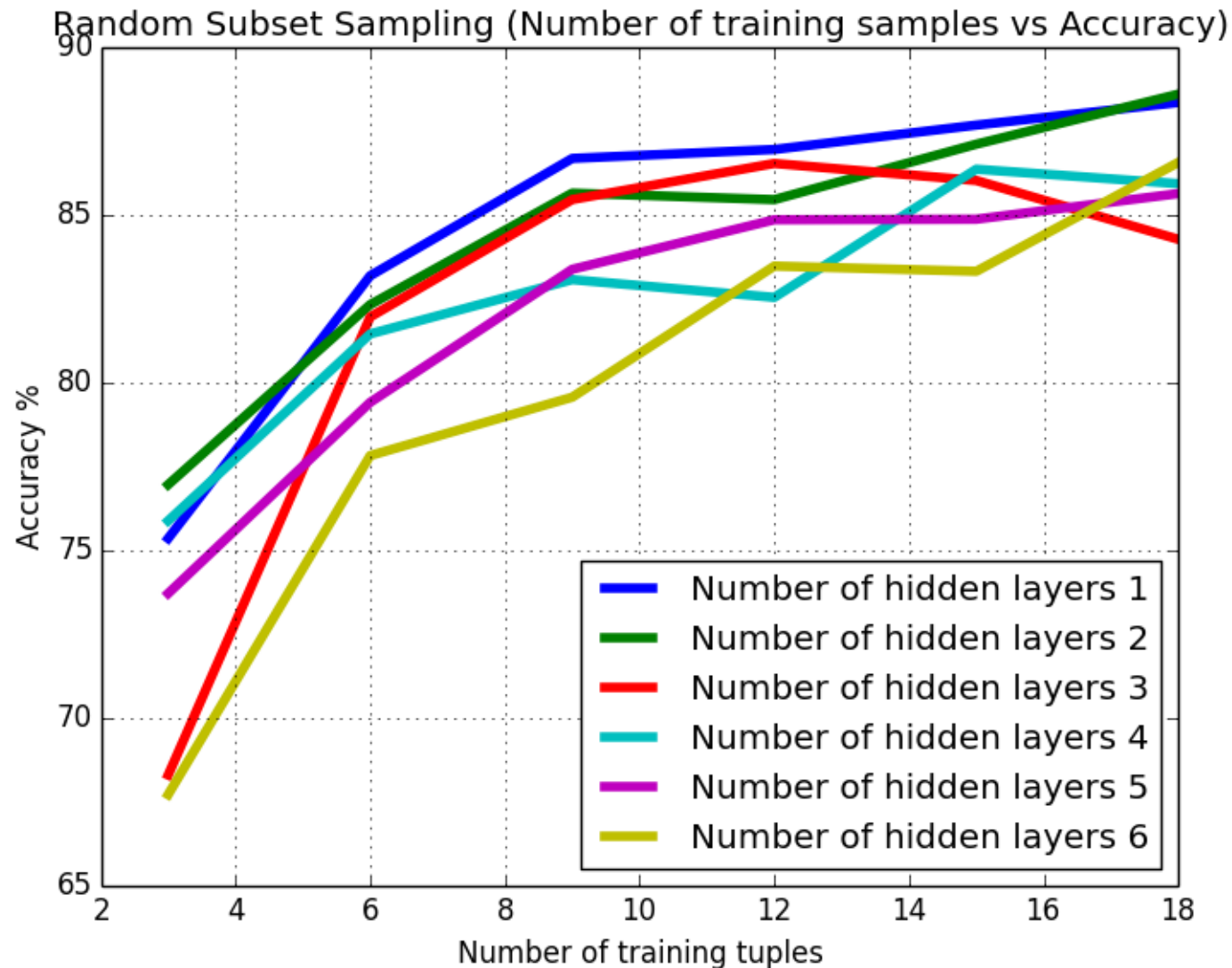
Conclusion

- It is possible to predict the values of personality traits of individuals using their facebook activities/profile with the help of a properly designed neural network with a certain amount of accuracy.

Applications

- Online marketing system can recommend product in personalized way by analyzing individual's profile in Social Networking Sites.

- Instant feedback: there are no questions at all and we get a score in a matter of seconds!

- Difficult to fake: in traditional testing, people often misrepresent who they really are (even if they do not mean to). By observing actual records of behaviour and choices individuals made in the past, the system largely circumvent the opportunity to 'cheat' the assessment

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