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February 25, 2019

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### Recommended Citation

Anonymous, "Targeted Artificial Personality Matching", Technical Disclosure Commons, (February 25, 2019)  
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# Targeted Artificial Personality Matching

## Abstract

The present disclosure describes a system for building an Artificial Intelligence (AI) assistant that mimics personalities of friends on a social media platform. A ranking module generates a ranked list of the friends based on a user's frequency of communication with them. A data input module collects images and associated text posted by top-three friends from the ranked list of friends. A feature extractor extracts features of the images and the associated text provided by the data input module. A machine learning module is trained with sample images and their associated text posted by the users with known personality traits to generate a mapping of the features of the sample images and the associated text with the known personality traits. The trained machine learning module, thereafter, is capable to predict personality traits of the top-three friends from the ranked list of friends. The predicted personality traits are integrated with the AI assistant. The AI assistant, therefore, can display the personality traits, which is an amalgamation of the traits of the top-three friends and is "friend-like", with which the user can interact just like s/he interacts with his/her friends.

## Problem

Friends might not be available online every time a user wants to have a conversation with them. This challenge can be overcome with an introduction of online AI assistants or chatbots, who are available for any conversation at any time of the day. However, such assistants or chatbots are developed with specific personalities and they are not able to customize themselves dynamically basis personalities of different users utilizing their services.

The present disclosure endeavors to solve these problems by accumulating personality traits in an AI assistant to create a friend-like personality for each user of the AI assistant.

## Description

### System and working

The system (as illustrated in Figure 1) described in the present disclosure is an AI assistant with a friend-like personality. A user profile database stores a friend list of a user on a social media website. A ranking

module ranks the friend list based on frequency of communication the user has with the friends. The ranked list of friends is provided as an input to a first data input module. The first data input module collects one or more images and their associated text posted by the user's friends on the social media website. The first data input module includes a web crawler that allows it to gather online content such as instant messages, tweets, multimedia chats, or other online content from the social media website. The web crawler reads one webpage at a time of the online content until all the webpages are read. A feature extractor generates a feature dataset of the images and the associated text. A machine learning module derives personality traits of the friends of the user. The machine learning module includes an Artificial Neural Network (ANN), which is trained using a supervised learning algorithm explained in the following section.

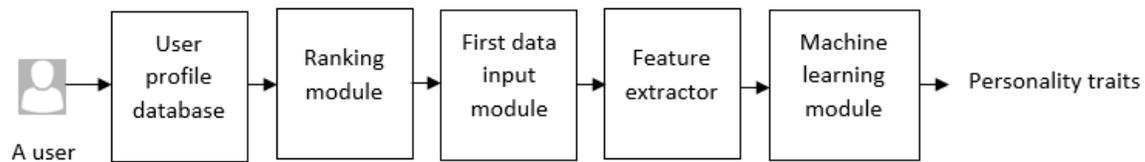


Figure 1: Block diagram for determining the personality traits of top ranked friends of the user

### **Training of the machine learning module**

A second data input module collects sample images and their associated text posted by sample users on the social media website. The second data input module provides the sample images and their associated text as inputs to the feature extractor. The feature extractor comprises of:

1. An image preprocessor
2. A text preprocessor
3. An image feature extractor
4. A text feature extractor

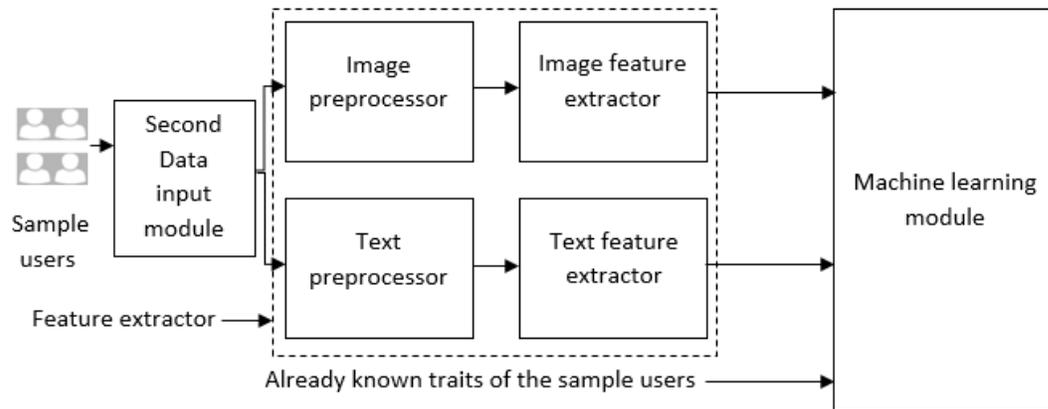


Figure 2: Training the machine learning module

The image preprocessor enhances features of the sample images for further processing. The image feature extractor generates a first feature training dataset, which includes features such as image content (objects in the sample images), filter(s) used in the sample image, popularity (count of likes, shares, and comments on the sample image). The text preprocessor and the text feature extractor process the associated text parsed from posts and generate a second feature training dataset, which includes features corresponding to the text, such as topics, sentiments, non-standard words (for example, “u” in place of “you”, use of non-word symbols such as “#”, “!”, etc.), writing style and top words. The first feature training dataset and the second feature training dataset are provided to the machine learning module. Already known traits of the sample users are gathered utilizing various personality categorization techniques such as personality tests. The known personality traits of the sample users are also provided to the machine learning module. The machine learning module maps the features in the first feature training dataset and the second feature training dataset with the personality traits of the sample users. Training of the machine learning module ends.

### Deriving the personality traits

The first data input module collects images and their associated text posted by a first friend (top ranked in the ranked friend list) on the social media website. The first data input module provides the images and their associated text as inputs to the feature extractor. The image preprocessor enhances features of the images for further processing. The image feature extractor generates a first feature dataset that consists of the features such as the image content, filter(s) used in the image and popularity. The text preprocessor and the text feature extractor analyze the text collected from posts and consequently create a second

feature dataset having the textual features. The extracted image features and the textual features are provided as inputs to a trained machine learning module. The trained machine learning module predicts the personality traits of the first friend using the mapped features of the personality traits of the sample users derived from the first and the second feature training datasets.

Similarly, the trained machine learning module predicts the personality traits of a second friend (ranked second in the ranked friend list) and a third friend (ranked third in the ranked friend list). The personality traits of the top-three ranked friends are accumulated in a personality trait superset. Multiple appearances of the personality traits in the personality trait superset are removed to form a subset of the personality trait superset. The personality traits in the subset thus obtained are integrated in the AI assistant. The user can interact with the AI assistant just like with his/her friends on the social media website.

#### [Additional embodiments](#)

In one of the embodiments, the personality traits of each user of the social media website can be derived by the trained machine learning module. The social media website stores the derived personality traits of each user in his/her user profile database. The ranking module generates the ranked friend list of a first user. The personality traits of the top-three ranked friends of the first user are accumulated in the personality trait superset. The personality traits in the subset of the personality trait superset (formed after removing multiple appearances of the personality traits in the personality trait superset) are matched with personality traits of other users (who are not in the friend list of the first user) on the social media website. A matching score is calculated based on frequency of the matched personality traits. If the matching score is more than a threshold value (which may be decided by the social media website) or if the personality traits completely match for the other user(s) identified, then these other user(s) could be potential friends for the first user. The social media website may suggest these other user(s) as suggested friends for the first user to befriend.

In an alternate embodiment, the AI assistant may have a dynamic personality. The personality traits of the top-three friends of the user may be derived in a periodic manner. The machine learning module updates the personality trait superset based on the features extracted from new posts of the user's friends (if there appears to be any changes in the personality traits). The AI assistant integrates the updated personality traits in its personality and provides a dynamic experience to the user.

## Conclusion

The number of users on social media platforms has been consistently increasing over the years. This encourages developers to add advanced artificial intelligence capabilities to them. Marketers are exploring these capabilities to generate more personal and interactive one-to-one engagements with their customers/users using various chatbots/AI assistants. To obtain a better engagement of the users, the present disclosure describes an AI assistant that is smarter and mimics the personality traits of the user's friends on the social media platforms.