Analysis of Personality with Machine Learning and Potential Usage of Personality in Gaming

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Machine with Personality

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Abstract: *A brief summary of the project including the purpose, the methods, the goal, and other important things.*
The purpose of our project is to develop a robot AI that has personalities just like humans. Our goal is to firstly find the personality score for each player in DOTA 2 and then utilize the score to build up the AI bot. The intuition behind all of this is because most today's AI bots are lacking this type of perspective trait. The method we are going to use including NLP, LIWC, CNN, RNN, LUA and other deep learning tools. The difficulty here including connecting the psychology aspects to machine AI and then apply it to the real world.

1. Background (Review of Related Literature):

The summary of the related literature, presenting important information and knowledge such as the background of the topic and the current research state.

Nowadays, many psychologists believe that there are five basic dimensions of personality, containing 'Extraversion', 'Agreeableness', 'Openness', Conscientiousness' and 'Neuroticism', which are also called as 'Big 5' personality traits. This have developed through a long time. As the development of algorithm and hardware, there are many robots, like Alpha-Go, they use reinforcement learning to build up an unbeatable AI, but they are lacking of personalities. Some research shows that by controlling the rewards and punishments, people can control robot's behavior's tendency. For us, we are planning to introduce behaviors that show personalities to the DOTA 2 world. It is a online video game that requires 10 players each side of 5 that trying to destroy enemy's ancient. For this game specifically, there is an AI called Open AI Five that already act like Alpha GO, but it still lacks of personality.

2. Introduction to the Project:

Inform how you are planning to investigate the topic in the project, including the methods to use and the goal to achieve.

We tend to analyze the player's selection of hero and the context in chat. For the chat context, we will use natural language processing (NLP) combined with Linguistic Inquiry

and Word Count (LIWC) to classify player's personality. Similarly, using NLP with deep learning to turn hero's name to vector and find the link between hero choice and personality. Moreover, we want to find which behaviors in game can be connected to which personality. Based on the result of first part of analysis, hopefully we will build up an AI bot in DOTA 2 that will have the similar personality depending on our analyzed results.

3. Introduction to the Dataset:

Introduce the data source, the size, and the background. Also provide some related information such as the methods of getting data and the obstacles.

We plan to mainly use the dataset from Kaggle and GitHub, which contains 50,000 matches from dota2. Also, we may require more data from the DOTA 2 server and even some website scraping data from the steam community in DOTA 2 (discussion forums), which may be more difficult to get. In the dataset, we have the information about players, heroes, chat context and so on. It recorded most matches from the DOTA 2 server. The obstacles of handling those data are from many perspectives. We have to build up own model to get the analysis down, and we also have to do some data manipulation and preprocessing because the data comes from multiple files and we have to somehow get what we want.

4. Plan:

Plans between every milestone and final. Please be specific.

For the first milestone, we are going to done most of the research and understand what the background of my studying topic. Also, we must find all the data that we want before that. After the first milestone, we will start to handle the dataset and finish the analysis with the dataset using our own model that gives the number of quantified personalities of each player. After the second milestone, we will try to come up with a simple AI demo that will utilize the personality trait as a tool in real gaming, and potentially finalizing our model with decent accuracy and AI working as fine.

(You don't have to write the proposal exactly as the template tells. But be sure to include all the key information.)

Reference:

CoverUER, "如何让机器拥有和人一样的思维", JianShu, April ,2017.
https://www.jianshu.com/p/7688adbce939

Hui Chai, "The Personality in Artificial Intelligence", PURSUIT, Oct, 2019.
https://pursuit.unimelb.edu.au/articles/the-personality-in-artificial-intelligence

Adamqqq, "Dota 2 AI 简易开发教程", CSDN, Nov, 2017.
https://blog.csdn.net/adamqqq/article/details/78643978

Kendra Cherry, "The Big FIve Personality Traits", VeryWellMind, Oct, 2019.
https://www.verywellmind.com/the-big-five-personality-dimensions-2795422

Federico Vaggi, "Machine Learning in Dota 2", Github, April, 2016.
http://federicov.github.io/word-embeddings-and-dota2.html

"Discover Your Inner Hero", dotabuff.com. https://www.dotabuff.com/personality

Ardi Tampuu, "Multiagent cooperation and competition with deep reinforcement learning", *PlosOne,* April, 2017. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0172395