Mobile Application Design:
Poker and Psychometric Psychology through AI and Human Interactions

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Introduction

Poker is the most well-known completive playing-card game with around 40 million adults playing at a regular basis. [1] This world-wide recognizable game attracts and captivates the audience by allowing players to use the combinations of adaptability, luck and skill against one another. This mobile application focuses on using Poker as a focal point in reading a person's poker and psychometric psychology. The application will have two platforms developed. The online platform is a stage where users can play against each other, in which the application acts a the dealer for the players. It integrates a lobby system and database where the results and scores will be stored. The offline platform includes a Poker Bot for a user to play against. The Poker Bot will be able to make smart decisions and records every action the user makes. This information will be further analyzed into two section, Poker and Psychometric Psychology, where the users can have the opportunity to improve in poker as well in their own psychometric personnel. With both these platforms developed, the mobile application core functions will be allowed and appreciated by the users.

Poker Bot

The Poker Bot intelligence is based on two sectors: Statistics and Weighting System. The statistics system is modeled after the "Opponent Modeling in Poker "written from the Department of Computer Science in the University of Alberta.[2] The Statistics   sector is formed around the calculation of Effective Hand Strength (EHS).

$$EHS = HS \ x \ (1 - NPOT) + (1 - HS) \ x \ PPOT$$

EHS's calculation is separated into the Hand Strength (HS), Negative Potential (NPOT) and Positive Potential (PPOT). HS is the sole calculation of the cards winning percentage that are shown on the board. NPOT and PPOT is the possible changes of the winning percentage when additional cards are being played in the round. Combining these three factors, it will give the winning percentage that is dependent of the given value of the cards.

5 Cards	7 Cards	7 Cards	7 Cards	7 Cards
	Ahead	Tied	Behind	Sum
Ahead	444746	4566	156568	$605880 = 612 \ x \ 990$
Tie	372	8538	0	$8910 = 9 \ x \ 990$
Behind	109416	1754	344230	$455400 = 460 \ x \ 990$
Sum	554534	14858	500798	$1070190 = 1081 \ x \ 990$

Figure 1. Bot Hand and is A♦ Q♣ and the flop is 3♦-4♣- 7♣, the HS is 56.6%, PPOT is 21.4 % and NPOT is 27.8%.

However, Poker isn't only about statistics, but the ability to read against the opponent. The Weighting System (WS) is built to discover the opponent's playstyle and adapt throughout the game. It records all the player's action in different stages, winning and folding percentage.

$$WS = \frac{Same \ Action \ at \ Same \ Stage}{All \ Four \ Actions \ at \ the \ Same \ Stage} \ x \ Winning \ Percentage$$

With both the Statistics and Weighting System intact, the Poker Bot will be able to choose the four actions of Call, Fold, Raise and Check against the user while recording information for the Poker and Psychometric Analysis.

Poker and Psychometric Analysis

The Poker Analysis will analyze all the actions made against the Poker Bot. It will show the percentage of all the correct or wrong actions, amount and timing of each action. Combining these together, we can discover the playstyle of the opponent (Tight vs Loose and Passive vs Aggressive) and give suggestions to help the user improve his or her technical ability in Poker. Since the data received in Poker is limited, the only two possible Psychometric Analysis Tests that could be tested are Numerical Reasoning Tests (NRT) and Situational Judgment Tests (SJT). [3] NRT is a math test that focusses on a person's basic math skills in averages, percentages and ratio. The NRT score will be based on the EHS score of the user. If the user plays his or her action correctly against the EHS score, it will show that the user not only have the ability, but the dependency on focusing statistics in a poker match. On the other hand, SJT is a test to see how a person react in tough and high pressured situations. These situations will be comprehended from the Poker Bot's Raise action. The timing and result of the user's decision will give a score on the SJT as to how well he or she deals in these high pressured moments.
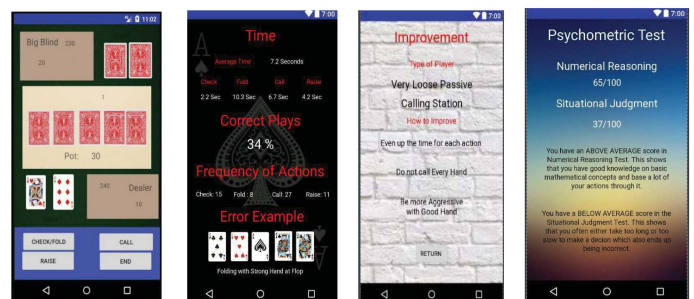
Mobile Application Display

Figure 2. Poker Bot   Figure 3,4 and 5. Poker and Psychometric Analysis

Conclusion

The Mobile Application gives a large range of function and platforms for its users. Anyone with a smartphone can play against one another without needing a dealer and poker chips. Furthermore, interactions with a Poker Bot will analyze the Poker Strategy, Numerical Reasoning and Situational Judgment where users can learn and improve themselves. Combining all these factors, it will give an user experience where users will enjoy and appreciate.

Acknowledgments

References
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[3] "Psychometric Tests | FREE Aptitude Tests", *Practice Aptitude Tests | FREE Online Aptitude Tests*, 2018. [Online]. Available: https://www.practiceaptitudetests.com/psychometric-tests/. [Accessed: 11- Jan- 2018].