Title: POKER CARD CLASSIFICATION AND GAMEPLAY USING ARTIFICIAL NEURAL NETWORKS AND C4.5 DECISION TREES

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ABSTRACT

Poker has become relevant in the field of Artificial Intelligence with a history that dates back to 1984. Poker AI has advanced quite drastically since that time. And in this study the researchers' aim to create a prediction model enhanced enough to produce a high accuracy rating by modifying the models present in the study. This study utilized ANN and C4.5 Decision trees and with its enhancements. First, the researchers developed a game environment for the bot to perform and play a poker game. The researchers then implemented an artificial neural network with Hyper parameter tuning for the bot's ability to identify hand card strength. The Decision Tree or C4.5 specifically was later modified and enhanced for making decisions whether to continue in the game or fold. Both ANN and C4.5 are improved during the simulation. The researchers' results showed a gradual improvement to both models being modified during the simulation. Results also showed that cleaning data in decision trees and by using its errors as it works well with interactions and it supports different loss function which is vital during this study. Though results vary from the hardware, it is being tested the accuracy still showed a high value. From the researchers' perspective, this study emphasizes a rule-based method only which is limiting the AI's ability to learn from past experiences. It is recommended to study more about reinforcement learning for the trained agent to learn from its mistakes.

Keywords: Poker, Artificial neural networks, Imitation Learning, Decision Trees.