A Novel and Convenient Go-Games Win-Rate Estimation and Misplay Detection Model Based on Convolutional Neural Networks

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The existing Go AI System assumes players operate at the highest level, presenting analyses often inaccessible to most enthusiasts. This study addresses this gap by proposing novel estimation models designed specifically for amateurs, facilitating skills improvement and enhancing accessibility to the game. This study introduces a win-rate estimation model for Go board images, departing from conventional move-by-move analysis. Leveraging the data from professional reports by Star Array Go, the study employs computer vision technology to segment board images and extract matrix data which is then analyzed using convolutional neural networks. Through extensive training and testing on a data set comprising 28113 samples, the model achieves an accuracy exceeding 87%, with peak performance surpassing 90%. Additionally, this study presents a game misplay detection model that allows players to specify the number of moves for win-rate detection. This model analyzes batches of moves, identifying areas of significant reduction in win-rate and providing valuable feedback to players. Both models are designed to address the limitations of the traditional Go AI System, providing accessibility and usability for ordinary amateurs. Both models operate independently of existing game platforms, eliminating the need for GPU configuration and monetary transactions. By leveraging standard computer setups, models facilitate batch estimations through direct screenshot recognition, enhancing their accessibility and practicality for amateur players. I expect the findings of this study will contribute to the broader discourse on AI applications in gaming and hold implications for the development of user-centric AI solutions across various domains.