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New Rules for a Newer and More Challenging Game of Chess

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Abstract

The goal of this project from the beginning was to create a mobile application that allows users to play chess more interactively. The application is aimed at chess enthusiasts (amateurs or professionals) who study it in more detail and who play regularly. Currently, many users play chess exclusively online, either on a web or mobile application, while lessons and study are conducted through courses or free online engines. In this context, the proposed application extends the standard formats of the chess game into a variant with features that are currently not found in a standard game.

Keywords: chess, web application, interactive game.

1 Introduction

Chess is one of the world's oldest and most complex strategy games, with a history spanning over a millennium [1, 2]. Originating from India, where it was known as Chaturanga, the game spread to Persia, then the Islamic world, and eventually to Europe, becoming popular worldwide [1]. Interestingly, it also has a four-player variant (see Figure 1 on the right). Over the centuries, chess has been appreciated not only as a form of entertainment but also as a means of cultivating intellectual and strategic skills [3].

The chess set consists of a square board divided into 64 squares, alternating in light and dark colors, and 32 pieces equally divided between two players. Each player has a king, a queen, two rooks, two

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Figure 1. Example from Chaturanga from Rajasthan, India (two players on the left and four players on the right)

knights, two bishops, and eight pawns. Each type of piece has a specific way of moving, and the main goal of the game is to checkmate the opponent's king, that is, to place it in a position where it cannot avoid being captured. Chess is not only a test of individual skills but also a symbol of strategic thinking and long-term planning. Players must anticipate their opponent's moves, protect their pieces, and create opportunities for attack. This requires not only a deep knowledge of the rules and tactics but also the ability to think several moves ahead, evaluate positions on the board and make quick and precise decisions.

In the modern era, chess has experienced a revival due to technology. Online platforms allow players of all levels to face opponents from around the world, analyze famous games, and improve their skills through interactive training. Additionally, computers and artificial intelligence have brought new dimensions to chess analysis and understanding, offering unprecedented learning and competition opportunities (see the matches from 1985-1996 between the great Russian champion Garry Kasparov and IBM's Deep Blue [4, 5]. These developments have cemented chess as a timeless game that continues to fascinate and challenge curious minds everywhere [6, 7].

2 Architecture and Implementation

The application is structured using the MVC (Model View Controller) model. The data modeling and main functionalities will be presented below.

2.1 Data Modeling

Data is modeled using 8x8 matrices. In the initial stage of the project, we used standard chess notation (Forsyth Edwards Notation - FEN) to mark each piece on the board. FEN is a standard used to represent a specific position in a chess game, providing a simple and compact way to describe the arrangement of pieces on the board and other relevant game details [8].

2.2 New Rules and Moves

The pieces can receive upgrades during the game. Instead of creating rules that occasionally apply to each piece, we decided to isolate each upgraded piece and replace the standard ones when necessary.

UKNIGHT and UBISHOP* - These pieces don't exist specifically in the game, the upgrade in their case involves replacing one piece (knight or bishop) with the other, with specific situations favoring one over the other.

UPAWN - standard pawn rules are maintained but with the ability to capture diagonally and move two squares instead of one. The pawn can be promoted to any piece (QUEEN, ROOK, BISHOP, KNIGHT, UROOK, UQUEEN) when it reaches the final rank.

UROOK - standard rook rules are maintained, with the ability to jump over any piece during movement (without capturing it) to the next square, provided no piece of the same color occupies that square.

UQUEEN - reduced ability to move diagonally more than one square but otherwise maintains the standard queen rules. This upgrade is theoretically a downgrade, with the advantage being that the change is chosen by the player for their opponent, not themselves.

3 Usability Tests

We tested the application to discover similarities and differences between this and a standard chess game. The tests were conducted only

in single-player mode, so we cannot provide a 100% accurate description of what to expect from the app in two-player mode. However, we can use my extensive chess experience, both online and over the board, as a useful tool in these comparisons.

Similarities: (1) The game format is similar, making it easy to understand the rules after a few turns for someone who knows standard chess moves, (2) Balancing thinking and analyzing the available moves with the time allocated for each move, maximizing one and ignoring the other gives an advantage to the opponent, (3) Classic chess principles apply to both: bring out all your pieces early in the game, protect the king, capture pieces advantageously, and create an attack to checkmate the opponent.

Differences: (1) Extra time is needed to manage upgrades advantageously, (2) Less time to find the best moves, (3) Lack of experience with these possible upgrades reduces the use of standard chess openings, as an upgrade can disrupt an entire attack plan, (4) The existence of upgrades favors aggressive play, as the pieces can quickly get close to the king, (5) A much higher probability of fatal mistakes due to the difficulty in accounting for specific upgrade moves.

4 Conclusion

The usability tests we performed showed the interest of chess players in the proposed version, demonstrating the potential of this project. After creating the Improved Chess application, several aspects related to the creation process and the game itself became evident. Here are the main takeaways: (1) Using a real device instead of an emulator to run and test the application is usually an advantage. Connecting an Android phone to Android Studio is easily done, whilst an emulator can consume a lot of resources on the host device, possibly hindering both debugging and compiling, as well as the app's actual running, which may not provide an accurate experience of the game. (2) Managing the application in an MVC format simplified the separation of its main components. Without such an approach, implementation could become

confusing, making it harder to search, add, and change code.

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