

# Online Chess Portal- Learning and Playing

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**Abstract**—This paper showcases an online portal for chess game providing human to human capability as well as human to computer capability for both playing and learning respectively. For the human to human capability, the humans need not to be present in the same geographical location physically. They can play the game of chess from varied places. However, for the learning purpose the interaction is completely based with the computer and it is both offline and online. In this portal presentation, the users have to register themselves and are provided with a unique identification number to login in again and to learn or play against computer or other registered user. The moves as well as the previous history of the games played and the tournaments participated are kept in the repository database and will be shown to the registered users on request.

## 1. INTRODUCTION

Chess is a game that has been developed to play offline i.e., it can be played against a computer or a human present at the same physical location. However, when the game is played online the opponent can be at any geographical location and may be totally unknown to the player. For the online game, the player has to register himself and a unique identification number will be provided on the successful registration along with a password for further usages. The administrator handles the registration procedures and also checks on the duplicity of the users. The main portal comprises a normal lookalike chessboard providing two sided panel. The game can be played and is saved upon completion for future references. The player has to wait till the completion of the move of the opponent. The player can also redo a move with permission of the opponent and also forfeit a game after or before the commencement of the match. There is also a facility of communication between the players with the help of text, so that it can benefit both the players. After completion or stoppage of each game a log is saved about the game, so that for each game can be resumed after a certain interval of time. There is also provision about learning about the game of chess through various tutorials. The registered users can also play with the computer to improve their skills as well as learn new tricks. The users can also visit the history page for referring different games that has been played earlier to detect their mistakes in certain tournaments.

## 2. BACKGROUND

### A. Existing Approach:

The conventional system of playing chess are one on one may be its computer or player. The offline games in computers are played by the individual located at the same place. Thus, there is unavailability of other players.

### B. Drawbacks of existing approach:

In the game of chess, the presence of two players is essential. But, it can be termed as its drawback also. In the case of offline chess both players and the single player and computer interactions are based on the single computer, which reduces the playing style variations. However, these variations in playing styles can be made available if the game is played online with different players from various geographical locations.

## 3. AIM AND OBJECTIVE

The main objective of this work was to design an online portal for the game of chess, where various users can register themselves as players. By using artificial intelligence (AI) approach, the functionalities of the special moves for each components of the game can be managed. Here, the users can not only play the game but also learn the nitty-gritties of the game using various tutorials and free online games at the beginners level. Advanced or professional players can also be a part of tournaments organized online.

## 4. LITERATURE SURVEY

Mark Ginsburg showed public code based on client server for playing chess over the web, with a repository of the games played (Ginsburg, 1974). It also showed that the users or players can register themselves with a unique self-declared identification number and can play the game of chess with another registered user. The main drawback of the web based chess were the unavailability of proper user interface i.e. the chessboard was showcased with the help of textual format only and the chessboard was shown in the form of an ASCII eight cross eight grid. The other big disadvantage was the penalty due to time constraint for the players having a slower web connection than their counterparts (Shannon, 1950).

Thomas (2006) explained the pervasive theory of gaming. In this paper, a game based on the theory of pervasive game of chess was implemented. Pervasive game helps to combine the elements of real, virtual and other various elements of the chess. These format of chess play is based on the advantages of both offline computerized game as well as the customary game of chess. The playing experience was set like the real time traditional chess play where users were set against each other playing on a conventional board of chess.

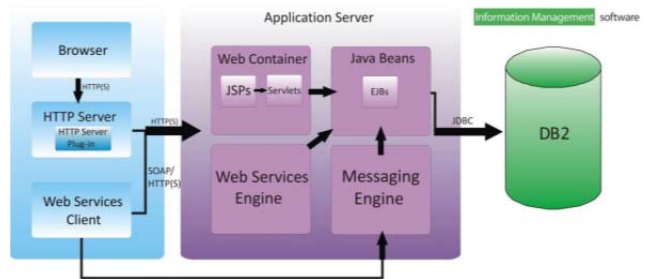
Previous works by Newell et al. (1958), Waters et al. (2002), Kiesel et al. (2009), Simon et al. (1973), Chase et al. (1973), Atherton et al. (2003), Pereira et al. (2008), Nikulina et al. (2000) and Thrun (1995) had provided different aspects of effective theory of gaming using computer science. Hajari et al. (2014) showed an implementation of artificial intelligence. The chessboard was embedded with sensors to play and was also displayed on the screen. This method of playing chess had two sections- firstly to detect the illegal moves concerned to a particular piece of chess and also to show the best possible moves for the same. The best moves were obtained by using min-max algorithm and the alpha-beta pruning techniques.

Bratko et al. (1978) had shown the method for chess enthusiasts to “chunk” together and thus reducing the complexity in AI while taking the positions into consideration. However, this idea and method is still in its nascent stage and a lot of assumptions and findings are required. The game of chess has been considered as the field of abundant ideas, which even ranges to various processes of AI like chunking (Bratko et al., 1978), different search techniques (min-max algorithm and alpha-beta) and also about the utility of information (Levinson et al., 1991). Adelson-Velskiy et al. (1975) showcased that two positionally similar locations may differ in many aspects and there is a need of special understanding to know the categorization of all the positions in chess. Nevertheless, the research related to this kind of problem is an open question and it is never ending.

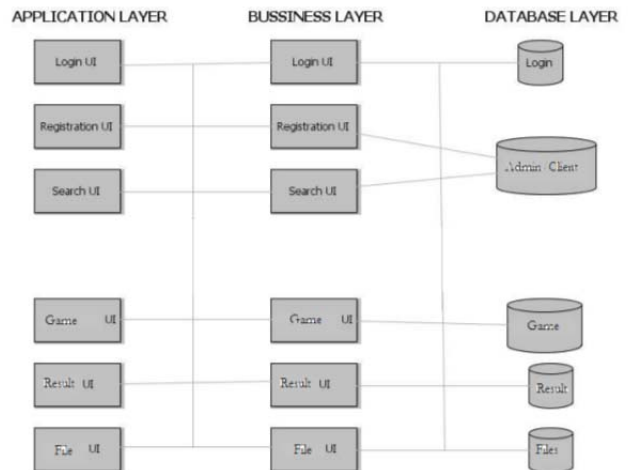
**5. WORK DONE**

- A. Functionalities of the product
  - ✓ The movements associated with the pieces has some policies related to them.
  - ✓ The profile of the players must be done through a proper registration process.
  - ✓ All registered must be entitled for watch the previously played matches.
  - ✓ Rating of players was done with evaluation algorithm.
  - ✓ Tournament activities must be managed properly.
  - ✓ Game must be having forfeit, save and resumption options.
  - ✓ Online chat between players during the play.
  - ✓ Tutorials are provided for registered users to learn and play.

- B. Characteristics of users:
  - ✓ Unregistered users: General users who are visiting the portals are not allowed to learn all the aspects of chess and are restricted to some basic level of learning tutorials. The registered users can only visit on the tournament or the advanced tutorials web pages.
  - ✓ Players in Tournament: The registered users can only play the tournaments and also can access all the pages in the portal.
  - ✓ Administrators: They are people, who are managing the portals and have all the rights.



**Fig 1: The connection structure of User to the database**



**Fig 2: Architecture Diagram**

**6. IMPLEMENTATION**

**A. User Registration:**  
 The user can register themselves according to the following steps in fig. 3. After the successful completion of registration, the user obtain a unique identification name along with a password for logging on to the portal (fig. 4).

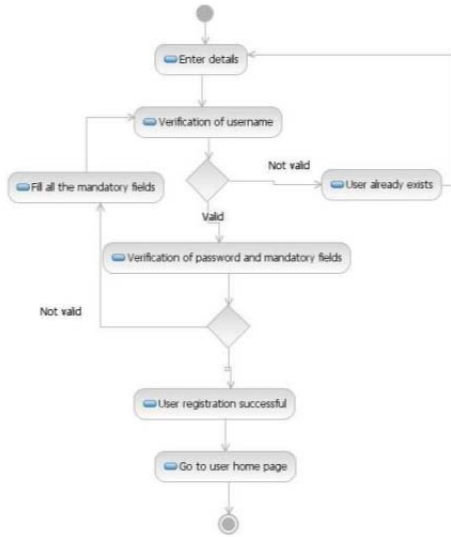


Fig. 3 User registration Activity

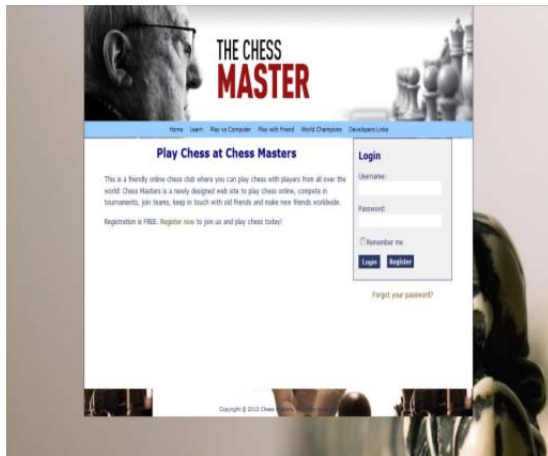


Fig. 4 Logging on Page

**B. Game Activity:**

The activities related to play a game by a registered user is shown in fig. 5.

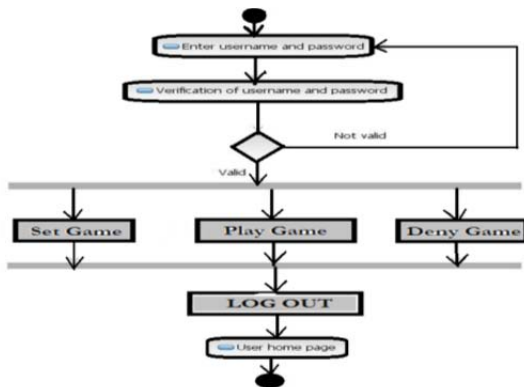


Fig. 5 Total game activity

**C. Flow of the game:**

Main Flow:

- (i) User opens program and specifies the IP address of the user to whom she wants to connect.
- (ii) If the connection attempt is successful the players start a new game.
- (iii) The players choose who will play black and who will play white.
- (iv) The board is drawn so that each player has her pieces at the bottom of her display.
- (v) The game moves to the play game state with the white player as the active player.

Sub Flows:

- I. User opens program and connects to an opponent's IP address.
- II. Once there is a successful connection a new game is started.
- III. The players argue over color.
- IV. Each player sees the game board from the appropriate perspective.
- V. The game moves into the play game state with the white player as the active player.

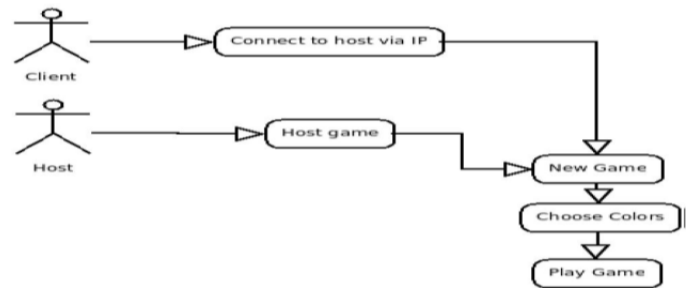


Fig. 6 Flow of the Game

**D. Moves:**

Precondition: During the Play state

- (i) The active player clicks a piece to select it.
- (ii) The game displays the positions it can move to.
- (iii) The player selects the new destination by clicking.
- (iv) The piece is moved there if it is a valid move.
- (v) Their opponent becomes the active player.

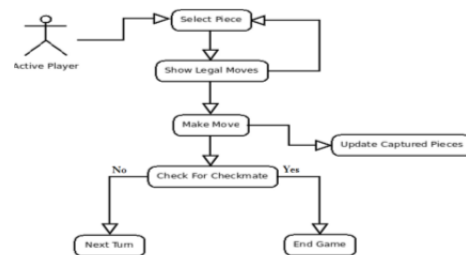


Fig. 7 Moves of a player

**E. Redo a move:**

Precondition: During play game state, and an undo hasn't been requested this turn.

- (i) The inactive player may request to undo their prior move.
- (ii) The active player is asked to accept/reject.
- (iii) If accepted, the last move is reversed and the inactive player becomes active.

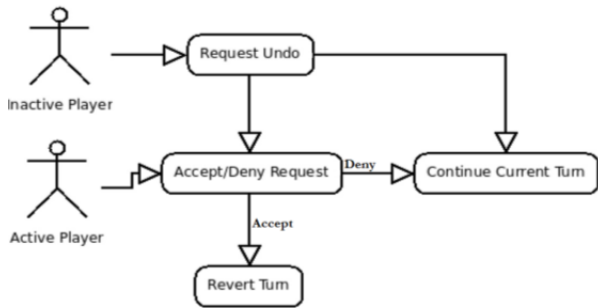


Fig. 8: The process of Redo

**F. Resign:**

Preconditions: During the Play game state

- (i) At any time during play, a player can select forfeit option.
- (ii) The player then confirms their forfeit.
- (iii) The game is immediately ended with the forfeiting player as looser.

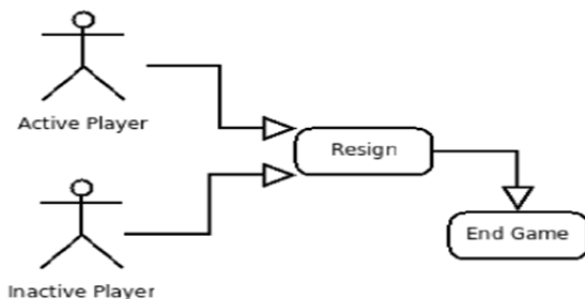


Fig. 9 The process of Resign/Forfeit

**G. Saving of Log:**

At any time either player may save a copy of the move log. They are asked for a file location. The move log is then saved using algebraic notation.

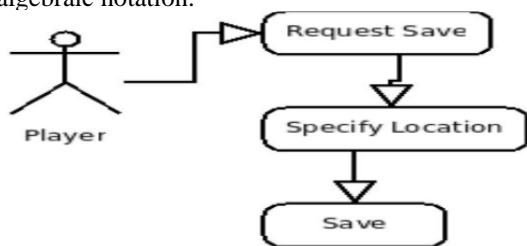


Fig. 10 Saving of Log

Web Page Formation:

**A. Tutorials:**

The webpages show the rules and various playing techniques.



Fig. 11: Tutorials for rules

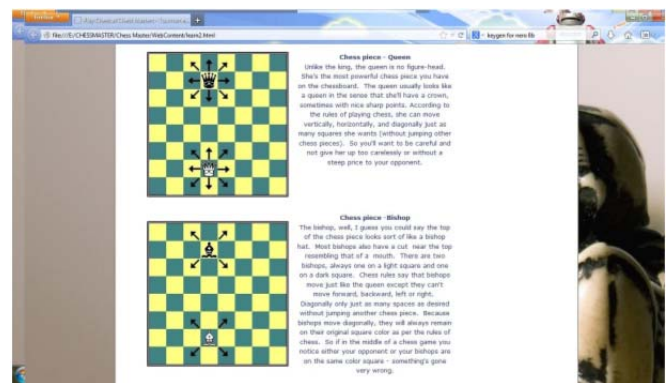


Fig. 12 Tutorials for moves

**B. Online Game Moves:**

The moves at a particular juncture of a game.



Fig. 13. The moves in a game (tutorial)



Fig. 14 Single Player vs Computer

### C. Admin webpages:

An admin can log on to the portal with its special id and password. He/she can also create tournament and update the tournament details.



Fig. 15 Admin logged in page



Fig. 16 Tournament creation



Fig. 17 Human vs Human

## 7. CONCLUSION

The main purpose of this work was to design a model for chess game which runs on the web. By, using the above portal system one can learn the various aspects of the game of chess. This will help in understanding the complete design and implementation of the functionalities in the online chess portal. This will help to reach all the chess enthusiast all over the globe to learn as well as play against each other. Thus, help to create an online world wide championship. This will also be economically viable, as players doesn't have to travel to attend a tournament or play a match. The log in the database will help new registered players to learn the tricks of the game, as by watching the old games from repositories and thus develop his/her standard of the game.

## 8. ACKNOWLEDGEMENTS

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