Indian Institute of Information Technology Allahabad,

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Design on

"3D Educational Game Using OpenGL"

"*Chess*"

Guide by

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Group - 01 by

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Chess

This project is about a chess game in 3D mode. Chess is a two-player strategy board game on a checkerboard with 8x8 grid dimension. There are two players in each game, the first player as *White* and the second player as *Black*.

[Design Chess Game]

Let's design a system to play chess:)

The system should support two online players to play a game of chess.
All rules of international chess will be followed.
Each player will be randomly assigned a side, black or white.
Both players will play their moves one after the other.
The white side plays the first move.
Players can't cancel or roll back their moves.
The system should maintain a log of all moves by both players.
Each side will start with 8 pawns, 2 rooks, 2 bishops, 2 knights, 1 queen, and 1 king.
The game can finish either in a checkmate from one side, forfeit or stalemate (a draw), or resignation.

Introduction

Chess is a two-player strategy board game that has been played for centuries. The game is played on a square

board divided into 64 squares of alternating colors. Each player begins the game with 16 pieces: one king, one queen, two rooks, two knights, two bishops, and eight pawns. The objective of the game is to checkmate the opponent's king, which occurs when the king is in a position to be captured (in check), and there is no way to move the king out of capture (mate).

Gameplay

Each player takes turns moving one piece at a time, with the white player moving first. The pieces move in specific patterns, as follows:

King: can move one square in any direction

Queen: can move any number of squares in any direction (vertically, horizontally, or diagonally)

Rook: can move any number of squares vertically or horizontally

Bishop: can move any number of squares diagonally

Knight: can move in an L-shape, two squares in a straight line in one direction, and then one square perpendicular to that direction

Pawn: can move forward one square, but capture diagonally. The pawn has the special ability to move two squares forward on its first move.

Special moves

In addition to the standard movement of pieces, there are several special moves in chess, including castling, en passant, and promotion.

Castling: a move involving the king and rook that allows the player to move the king to a safer location and bring the rook into play.

En passant: a special pawn capture that can occur when a pawn moves two squares forward on its first move, and an opposing pawn has the option to capture it as if it had only moved one square.

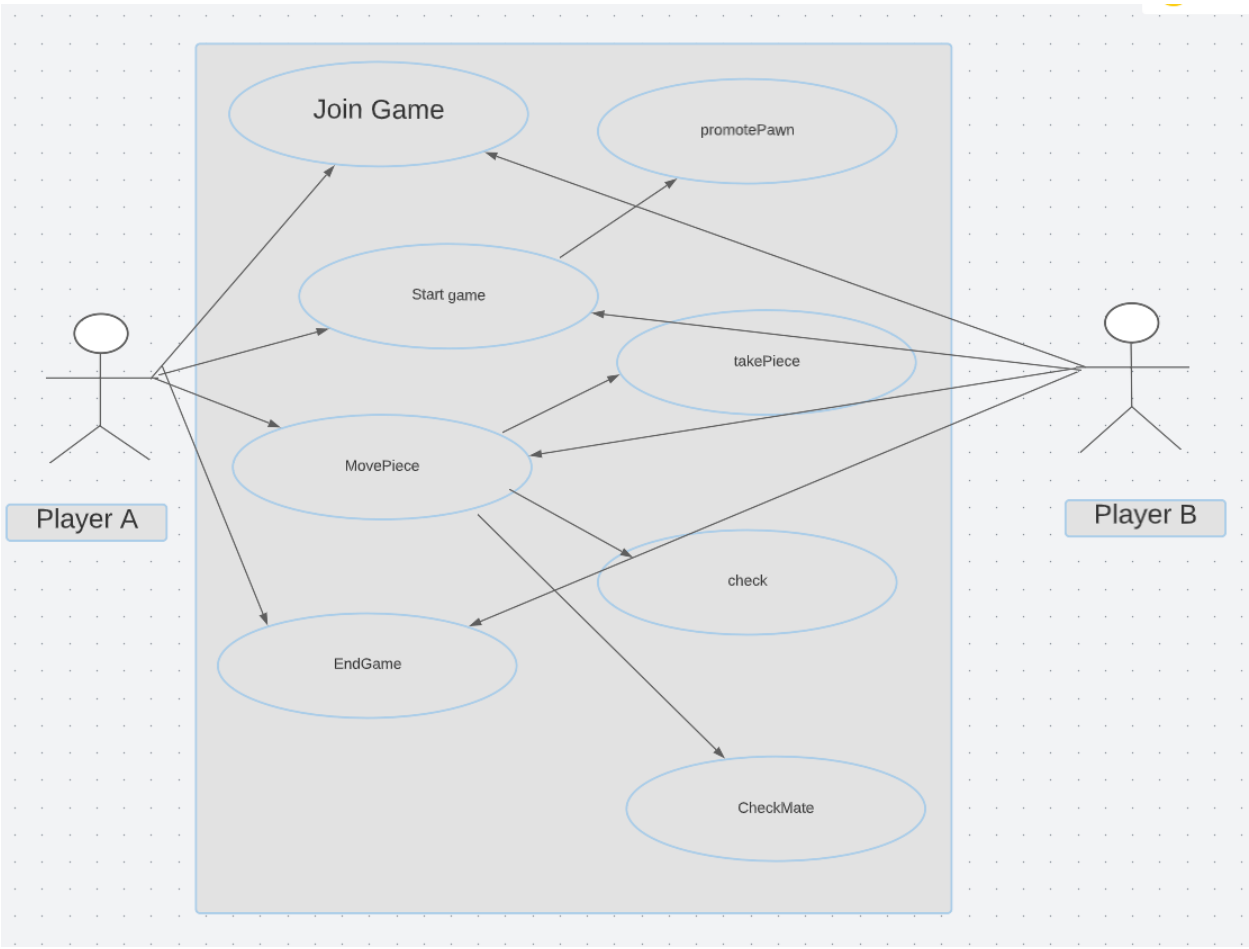
Promotion: when a pawn reaches the opposite end of the board, it is promoted to any piece the player chooses, except a king.

End of the game

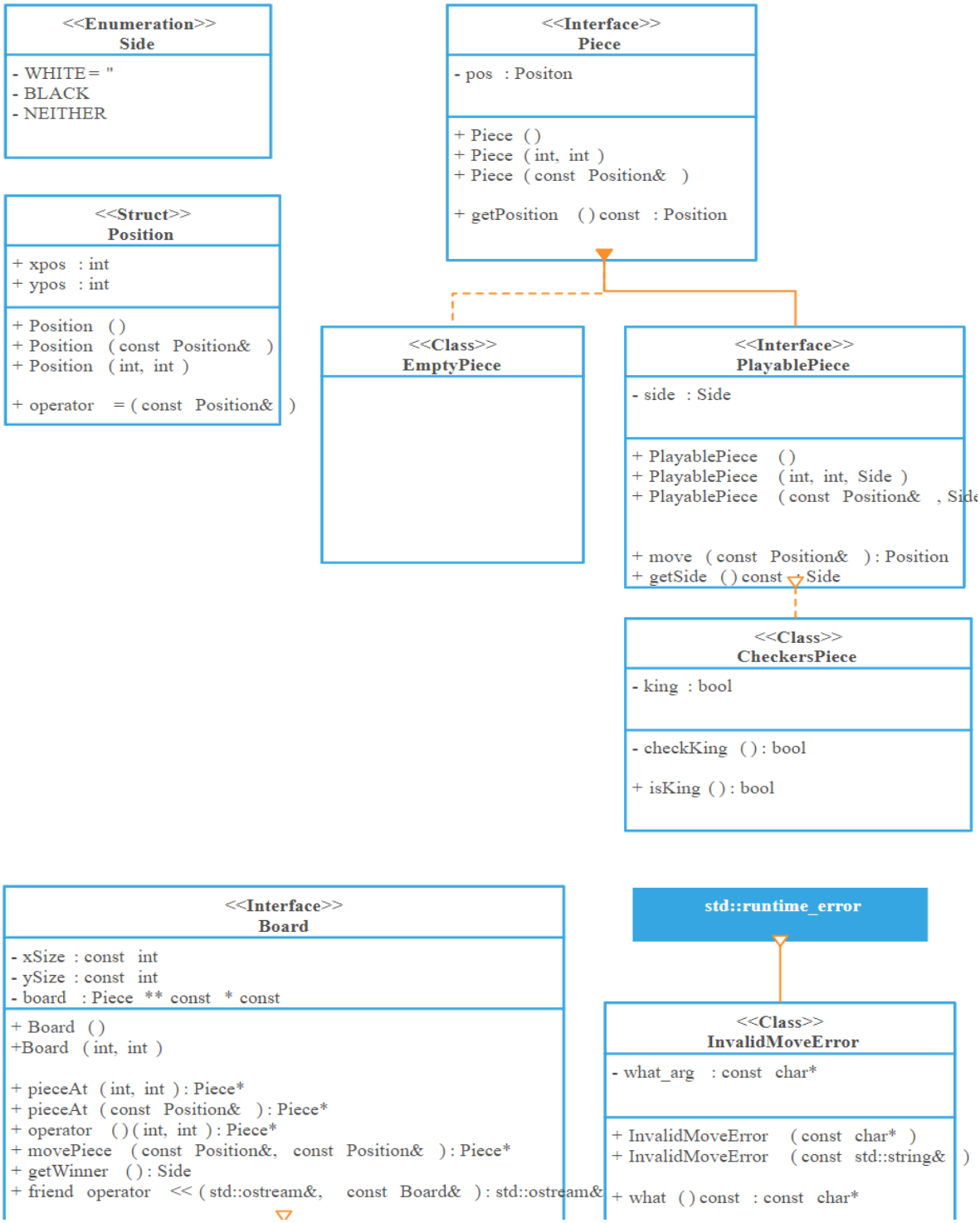
The game of chess ends when one player checkmates the opponent's king, resulting in a win for the checkmating player. The game can also end in a draw, for example when both players are left with just a king and no other pieces, or when a player resigns.

Proposed UML Diagram for Chess Game

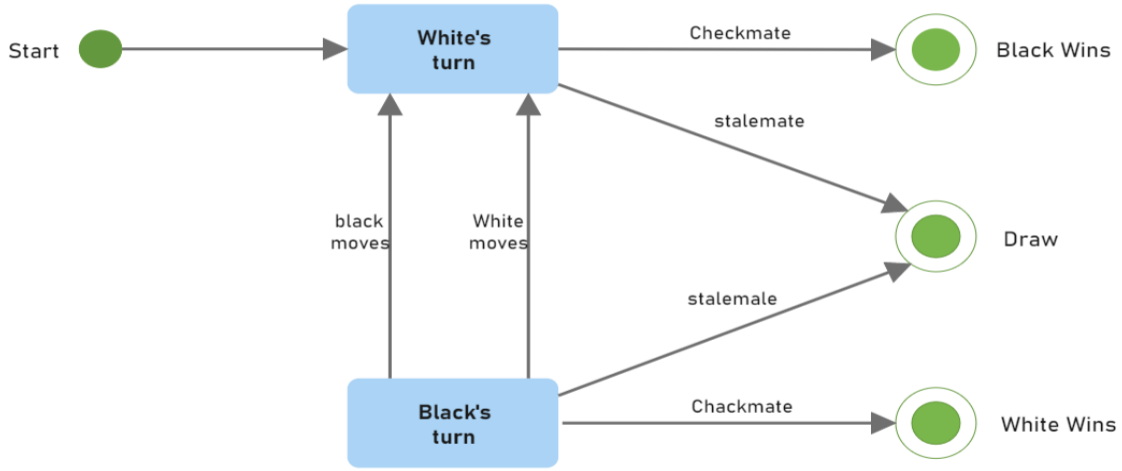
Use Cases Diagram:



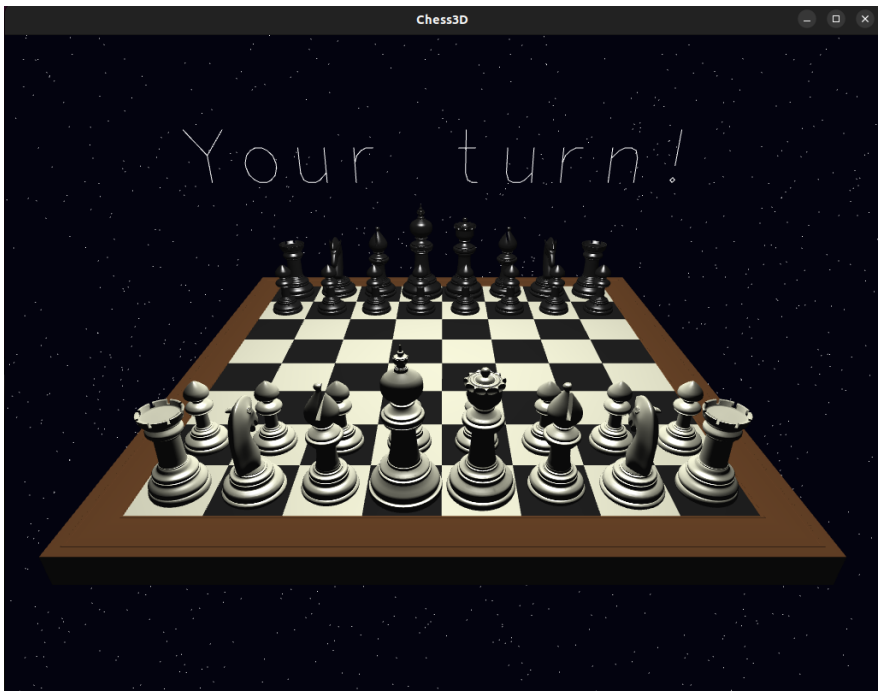
Class Diagram



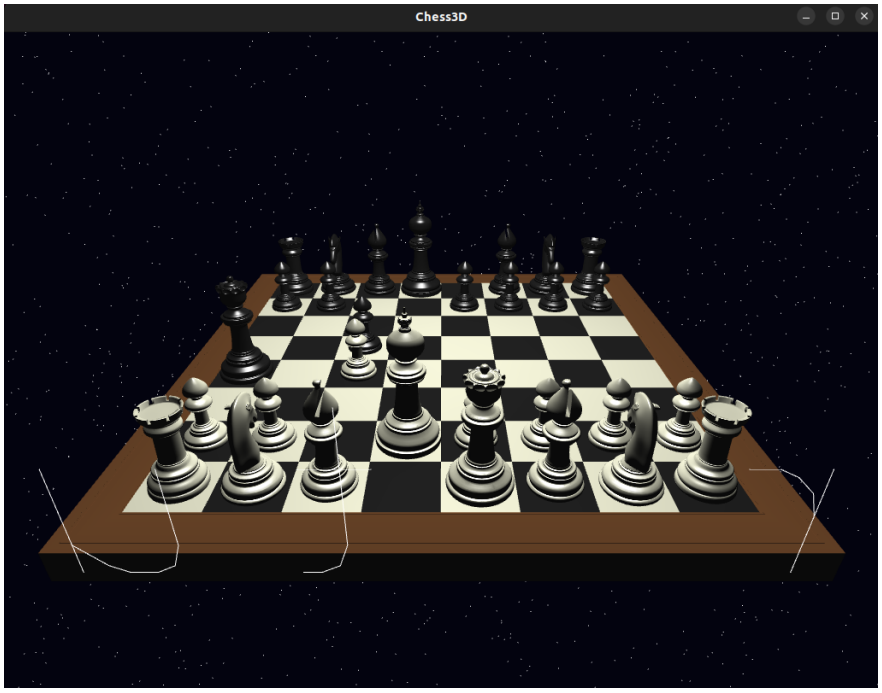
State Diagram:)



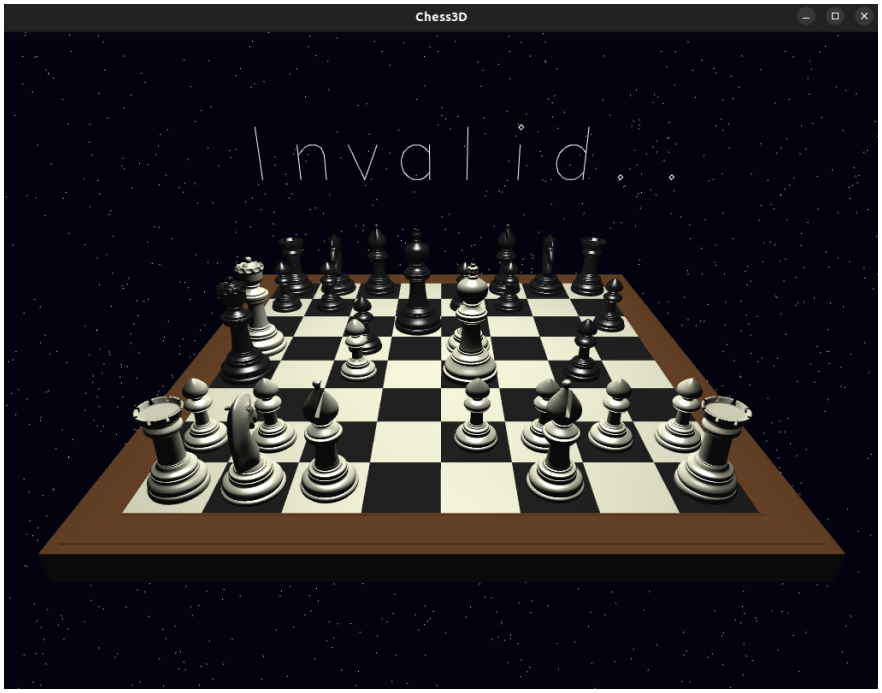
Screenshot



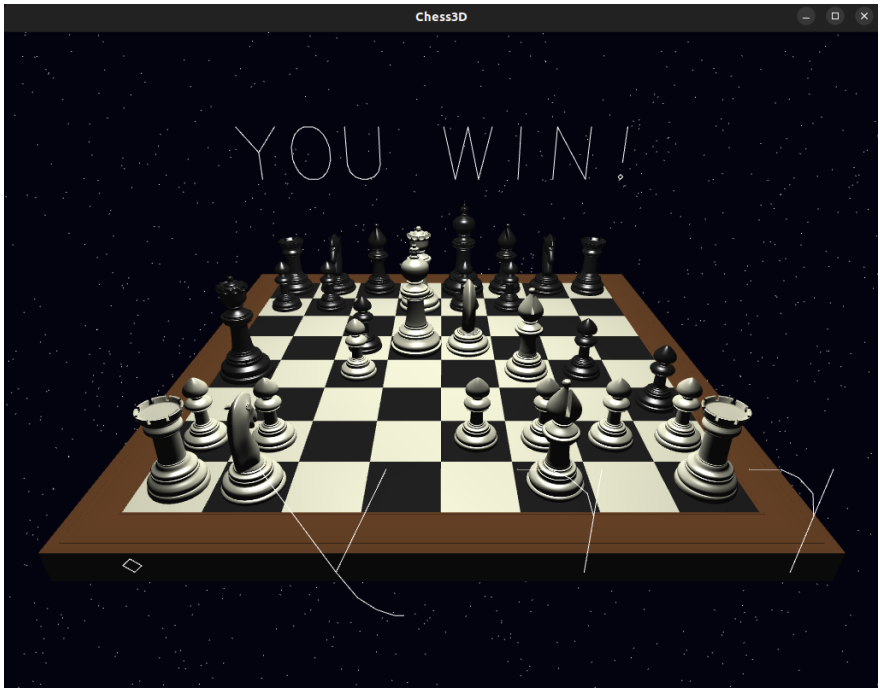
When we have start the game



When we have playing the game



When we have taken wrong step



When we have win the match

When we have start the game
When we have playing the game

Conclusion

The conclusion of a 3D chess game, like any chess game, is determined by the outcome of the play. The game ends when one player's king is checkmated, meaning that the king is in a position to be captured (in check) and there is no way to move the king out of capture (mate). A player may also

resign, forfeit the game, or the game may end in a draw if neither player has a chance of winning. In the case of a draw, this can occur when neither player has enough pieces to checkmate the other, when a stalemate occurs (where a player cannot make a legal move), or if the same position is repeated three times.

Future Scope

The future scope of 3D chess games depends on the advancements in technology and the changing interests of the players. Currently, 3D chess games are mostly played on computers and mobile devices, but with advancements in virtual and augmented reality technology, there is potential for 3D chess to be played in a more immersive and interactive environment.

In terms of the game itself, there is potential for new variations and rule sets to be introduced, as well as the integration of artificial intelligence to create more challenging opponents. There is also the possibility of adding more dimensions to the game, making it even more complex and challenging.

Overall, the future of 3D chess games will likely be shaped by the continued development of technology and the evolving interests and preferences of players. As long as there is interest in the game and its variations, it is likely that new and innovative versions of 3D chess will continue to be developed and enjoyed by players around the world.

Activity Chart:)