Artificial Intelligence AL2002

Project Proposal

Project Name: Three-Player Chess Implementation

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Submission Date: *March 22, 2025*

Contents

1. Overview

Motivation

Three-player chess exists as a strategic board game variation which adds triangular board geometry and multi-directional moving pieces and dynamically converting alliances between players. The complexity of this game remains without an official digital implementation along with a standardized rule set. The project fills this void by developing an operative three-player chess application which contains validated rules supported by an easy-to-use interface for human players.

Customer

- *Persons who play chess desire creative gameplay variations.*
- *The developers who create board games seek mechanics for multiplayer gameplay.*
- *Researchers studying rule formalization for non-traditional games.*

What the Project Will Deliver

- ***The Rule-Compliant Game Engine:*** *Defines three-player chess mechanics including how pieces move, what sequence turns occur in and rules that determine when the game ends.*
- ***User Interface:*** *A graphical user interface for local multiplayer interaction.*
- ***The game validation tools:*** *Tools that serve two purposes by stopping any forbidden movements while maintaining overall game status monitoring.*

How Long It Will Take

The duration of the project extends to 1 month with the following distribution of work:

- *Rule Formalization and board design will take one week.*
- *Game Engine Development will take two weeks.*
- *UI Implementation & Testing will take one week.*

Dependencies

- *The development platform consists of Pygame and Shapely for Python*
- *Three-Player Chess Rules: Adaptation of community guidelines (e.g., Three-Man Chess).*

2. Project Detail

2.1 Project Goals

Functional Goals

1. ***Game Engine**:*
    - *Implement a hexagonal board layout.*
    - *The game engine requires full enforcement of movement restrictions for all game pieces including promotions which span multiple edges.*
    - *The program needs to confirm success conditions that include checkmate and stalemate and alliance victories.*
2. ***User Interface**:*
    - *Support 3 human players through sockets.*
    - *The visual display should show how moving pieces, taking pieces, and which turn goes next.*
    - *The interface should show which moves made by the chosen piece are legitimate.*

Technological Goals

- *Modular code structure for future enhancements (e.g., online multiplayer).*
- *Use Node JS and Express JS to implement the interface.*

2.2 Project Scope

What the Project Will Deliver:

A standalone three-player chess system with:

- Rule-compliant game logic [1].
- Graphical interface for gameplay.
- Move validation and game state tracking.

What the Project Will Not Deliver:

- Online multiplayer functionality.
- Adaptive difficulty or automated opponents..

2.3 Project Team

Name	Availability	Comment
Sunny Shaban Ali	5 hours/Week	Sole team member

2.4 References

1. *https://www.chess.com/blog/Mortal_Michy/chess-for-3-players*
2. *https://www.chess.com/forum/view/chess960-chess-variants/chess-for-three-people*