NobleMate

Automatic Chessboard

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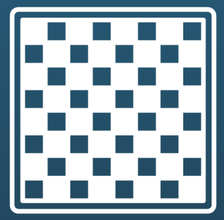
Overview

NobleMate allows for users to experience the game of chess, free of the hassle of moving the pieces! The aim is to allow for greater accessibility for the game for those who are limited by their physical impairments.



How It Works

1

Voice Control

Control the game field with simple voice commands

2

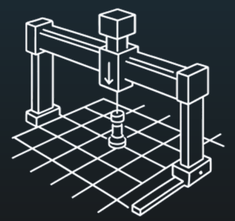
Stockfish AI Opponent

Challenge yourself against the powerful Stockfish AI.

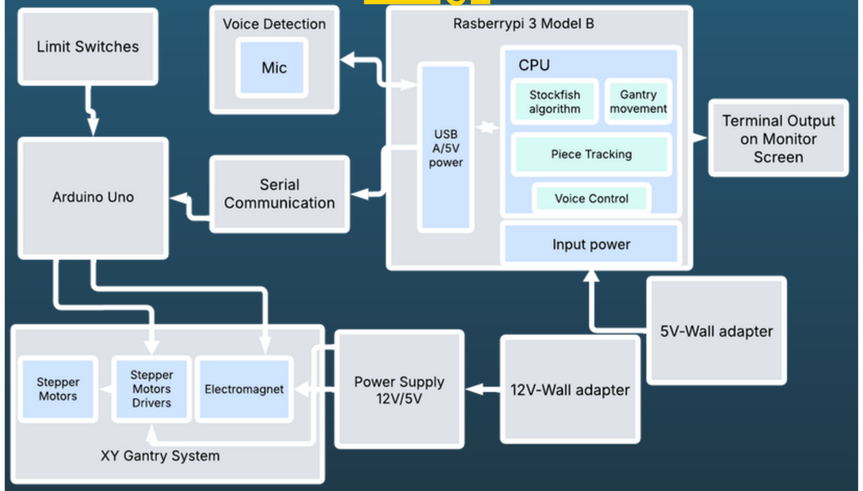
3

Automated Movement

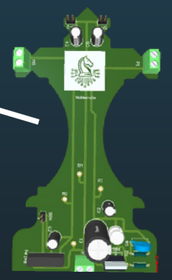
Mechanical Gantry System to move pieces without physical interactions.




Design



PCB Design



Design Criteria

1.) Voice Detection
2.) User-Friendly
3.) Automation
4.) Hands-Free

Powered by Google Cloud

Testing

Voice Detection

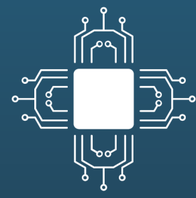
- Samples users input
- Rejects ambient noise

Gantry Movement

- Robust movements
- Serial communication of movement data
- Effective Calibration Methods

Power Distribution

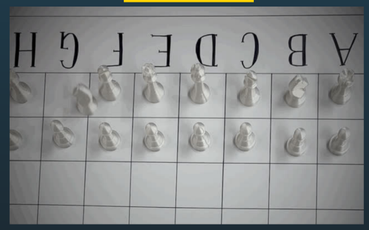
- Ensures constant power and prevents overheating



Logic Testing

- Validates moves through a chess matrix using Stockfish AI's chess algorithm


Results



- Passed 81% of the tests
- Cohesive Game Logic
- User-friendly HMI
- Variable settings
- Successfully helps individuals with physical impairments

Future Works

LCD Screen Implementation

Manual Mode