ITSP

WIZARD CHESS

INTRODUCTION

❖ We have made a chess playing bot in which pieces move by giving voice commands.

❖ Input for a move is given using voice commands in basic terminology used for chess.

❖ We have also made single player mode in which bot automatically moves the pieces.

❖ Voice to text program is also designed using pyaudio packages and standard mel frequency cepstral coefficients.

CONCEPTS BEHIND PROJECT

- ❖ Voice Recognition - Required to take the input from the player.
- ❖ Parallel processing - Required to run multiple code files simultaneously.
- ❖ Mechanics - Required for the appropriate movement of chess pieces.
- ❖ Artificial Intelligence - Used in the single player mode of the bot.

THEORY INVOLVED

❖ We used two servo motors to move electromagnet to a specific coordinate.

❖ Slider rods were attached to motors and moved with the help of rack and pinion gear system.

❖ To control the electromagnet transistor was used which was controllable by arduino.

❖ Parallel programming was used to run our chess code and rest of the code simultaneously to increase the speed of execution.

THEORY INVOLVED IN VOICE TO TEXT

❖ For converting voice to text python package pyaudio was used.

❖ Further processing was done using fast fourier transform and dynamic time warping.

❖ Comparison was done using the already stored sound signals for words which were to be used.

THEORY INVOLVED IN ALGORITHM

❖ For single player chess code, alpha beta pruning with minimax was used.

❖ This algorithm basically constructs a tree on the basis of further moves possible to a specific level and then evaluate the board at the end.Evaluation procedure is eased by alpha-beta pruning which prunes the trees which can never give right results.

PROBLEMS FACED

❖ We decided to make our own voice to text application to recognize words from a stored dictionary but we couldn't find and implement a very accurate algorithm.

❖ This project required perfect movements of motors which is very difficult to achieve as all the dimensions need to be very accurate.

❖ We used continuous servo motors so, it was difficult to calibrate motors to rotate specific angles.

❖ Also, we constructed clamps for slider rods out of wood which made it difficult to drill holes perfectly at same angles.

❖ The minimax algorithm is also a slow algorithm.

PROJECT PIC