Detectare Joc De Sah

Nistor Florin 1310B

I. Introduction

Chessboard and chess piece recognition is a computer vision problem that has not yet been efficiently solved. However, its solution is crucial for many experienced players who wish to compete against AI bots, but also prefer to make decisions based on the analysis of a physical chessboard. It is also important for organizers of chess tournaments who wish to digitize play for online broadcasting or ordinary players who wish to share their gameplay with friends. Typically, such digitization tasks are performed by humans or with the aid of specialized chessboards and pieces. However, neither solution is easy or convenient. The proposed algorithm processes pictures iteratively. During each iteration, it executes three major sub-processes: detecting straight lines, finding lattice points, and positioning the chessboard.

Chessboard and chess piece recognition with the support of neural networks

https://paperswithcode.com/paper/chessboard-and-chess-piece-recognition-with

II. State-Of-The-Art

Chess detection until know has 3 major parts: 1) Finding every square that the board has 2) Every square is put in a matrix of pictures and it keeps track of them and 3) When a square is different from last time it means a piece was moved and finds where.

In the first part we segment every square, every board has the same 64 squares and the same piece initial position so we can take advantage of that.

We crop every square with the initial piece in it and put it in a matrix, after we do that we check every piece of the matrix until we see that a square is different from the last time by having a second matrix that keeps the last information.

When we detect a moved piece, we would know what piece it is without having to detect it on the board with the advantage that every chess game has the same initial location and the computer can easily remember and keep track of them.

For example:

With the exact position on the matrix that the piece moved we would know that it is a Pawn so we would check on the matrix just the possible moves so we won't go through the matrix again when we know exactly where the piece could be. One step forward or two steps if it is on the start location, or attacks but we check first if it's another piece on that location before attacking.

After that me have a virtual matrix of chess that updates the moves so in the future the AI would know what moves to do.

III. Related Work

For now the project is just with pictures and we get the next picture that has a piece moved and checks again. Now the project is in a state that we can try and implement to not just check from pictures where the piece was moved but from a video when a piece is moved, for an easier work we would have the camera in the same position so it can easily detect the board and crop it, plus it would have a button to press to know when to detect the next moved piece so when we move a piece the hand would not be detected as a moved piece.