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Artificial Intelligence
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Report Connect 4 with Digit Recognition. Part 3: Mechanical Structure

The last component in the implementation of our Connect 4 is the mechanical structure that has the purpose of making the movements of both the computer and the player in the real board.

Justification

This part of the project was a necessity for having the previous software to interact and to work in the real world by using the Connect 4 board.

The complete structure is shown next:

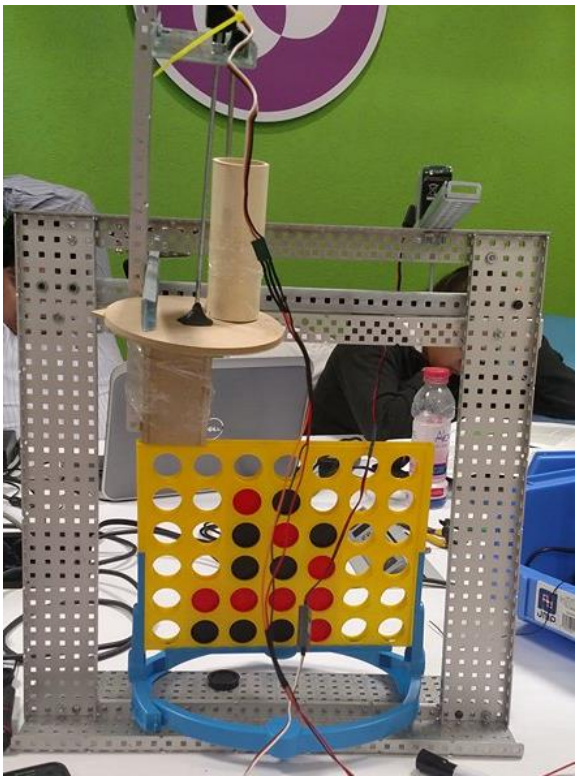

Figure 1. Mechanical Structure

This Structure can be divided into three parts:

1. Main Structure:

It is the big squared metal structure, which supports the rest of the systems and the axis for moving the Column Selector. All the structure was designed/made with VEX components and motors.

In essence, the structure made with two columns, which are joined by a metal plate at the bottom, this for giving stability. Then, an upper metal plate is also use for joining the columns and for giving the rail to the column selector. Lastly, there is a fixed Servomotor at the right top, which moves a gear for moving the column selector.

2. Column Selector:

The Column selector is the structure, which carries the next part and is the only movable module of the structure (right and left movement). The trail of this module is mounted on one of the metal plates of the top of the main structure.

3. Tokens' Module:

This is the most complex part of the mechanical structure, it consists in the tokens' collector (a pvc tube in this case), the tokens' distributor (which is a circle with a hole fitted for one token which is moved by a motor for dropping one token at the time), and the tokens' director (which receives the dropped tokens and guides them to the holes of the Connect-4.

The final model needs some adjustments as some pieces were pasted with glue and duct tape, so a more robust structure is required for a perfect working. In addition, the problems of alignment and weight balance need to be fixed in order to maximize the performance of this "robot".