Universal Robot 5 Tic-Tac-Toe

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Introduction

The subject of this project was to use the UR-5 robot arm and design an AI that will never lose to a player in tic-tac-toe. The robot would move the pieces on the board.

FIGURE 1. Basic design of the solution

UR-5

The UR-5 robot arm is designed primarily for use in a field of business and manufacturers.

The robot runs Linux based software including Polyscope GUI. Manufacturer supports a robot with a wide variety of different accessories such as: end-effectors, cameras, software packages, external and IO-panels. In the project we only used the wrist camera and 2F-85 gripper.

Methods

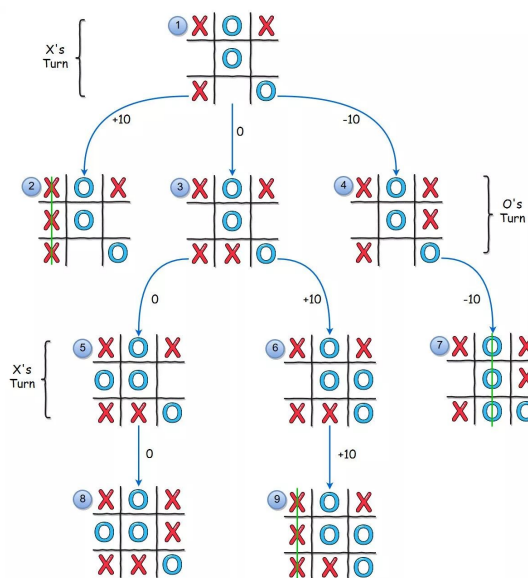The connection code as well as code for the AI was written in Python.We used Minimax algorithm for the AI.

FIGURE 2. Minimax algorithm

Results

The minimum requrements for the project were met; the AI-code works.

Unfortunately, we did not manage to get the connection between computer and robot to work properly.
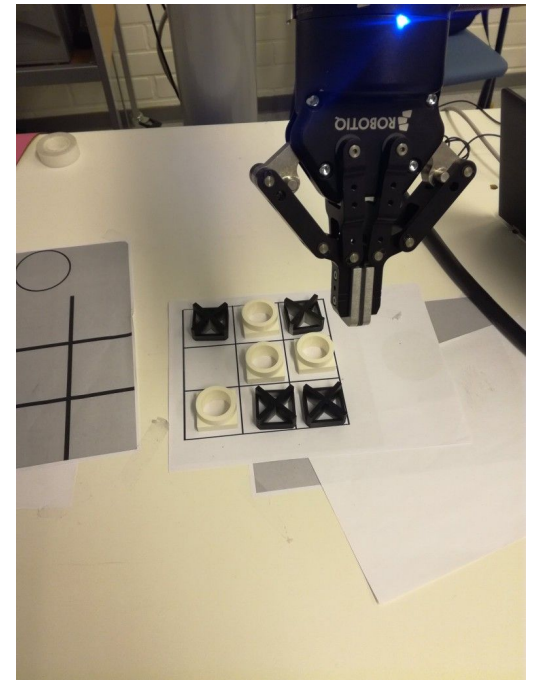

FIGURE 3. The robot in action

Conclusions

Although project was never completely finished.We think that we learned a lot about AI and algorithms

References

https://www.robots.com/images/robots/Universal/Universal_UR5_0002.jpg