Team Terminator

CSA Report

Current Status of Art for the Board Game Playing Robot

A paper based on this project was presented at the International Conference on Computer Vision and Robotics 2012 held at Bhubaneswar, India. There is no machine learning component in this device. It uses a brute force minimax algorithm to compete. It also uses a unique gripping mechanism.

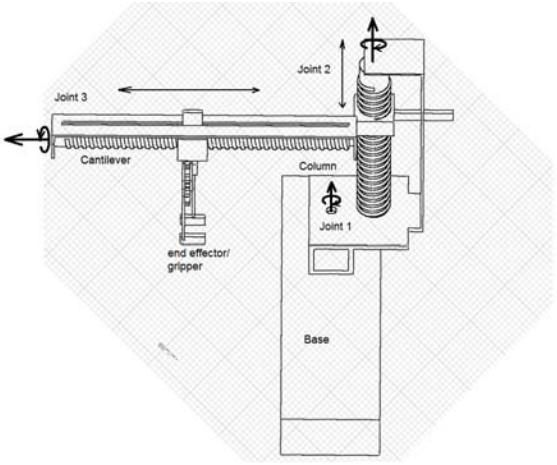

Figure 0.1

The Raspberry Turk is a robot that can play chess. It is completely open source and the methods for building it are documented on this website. The project is written almost entirely in Python, runs on a Raspberry Pi, and incorporates aspects of computer vision, data science, machine learning, robotics, 3D printing, and—of course—chess. The Arm is equally complex and difficult to build.

Figure 0.2

Matthew Lai at Imperial College London made the first major breakthrough in AI for playing

chess. Lai created an artificial intelligence machine called Giraffe that has taught itself to play chess by evaluating positions much more like humans and in an entirely different way to conventional chess engines. Straight out of the box, the new machine plays at the same level as the best conventional chess engines, many of which have been fine-tuned over many years. On a human level, it is equivalent to FIDE International Master status, placing it within the top 2.2 percent of tournament chess players. The technology behind Lai's new machine is a neural network. This is a way of processing information inspired by the human brain. It consists of several layers of nodes that are connected in a way that change as the system is trained. This training process uses lots of examples to fine-tune the connections so that the network produces a specific output given a certain input, to recognize the presence of face in a picture, for example.

Bibliography

A Simple Autonomous Robotic Manipulator for playing Chess against any opponent in Real Time http://www.nandanbanerjee.com/files/ICCVR-08AUG12-011%20paper.pdf , Figure 0.1

Deep Learning Machine Teaches Itself Chess in 72 Hours, Plays at International Master Level https://www.technologyreview.com/s/541276/deep-learning-machine-teaches-itself-chess-in-72-hours-plays-at-international-master/

Raspberry Turk
http://www.raspberryturk.com/ , Figure 0.2