RUBIK'S CUBE SOLVING BOT

Motive :

Students can learn how to solve the Rubik's cube(bot will solve Rubik's cube step by step) and also we can use this bot as a competitive bot after the small change in the executable instructions.

The Challenge:

To develop an autonomous robotic system which automatically detects the state of a Rubik's Cube, computes, using a known solving algorithm, the necessary movements to solve the cube, and finally controls the robotic system to solve the Rubik's Cube.

Hardware required :

- Void cube(similar to rubik's cube)
- Microcontroller
- 6 d.c motors
- 6 grippers(sticks)
- Stand holding the grippers

Software required:
Image processing software(e.g. matlab,pythano,C++ image processing software)

Abstract :

Autonomous Rubik's Cube Solving bot :
The objective was to design a system which is able to automatically detect the scrambled state of a Rubik's Cube using image processing and analysis methods.
The state information is used as an input for the computation of the solving algorithm.
The output of the solving algorithm is a list of necessary movements to bring the cube into its initial ordered state.
Finally, six grippers are being controlled to carry out the computed movements.

Image Processing and Analysis

The purpose of the image processing and analysis is to detect the scrambled state of the cube.Six sides of the cube will be analysed. This color information is passed to the solving algorithm. The hardware setup for the image processing and analysis consists of a web cam for taking up the images of the faces and the images are Processed by either using the (C++ code or python).

Computation of the Rubik's Cube Solving Algorithm

The calculated list consists of rotation operations by 90 or (-90) degrees for each side of the cube .
The results of the solving algorithm are passed to the robot control system by using the microcontroller.

Robot control

Robot will consist of six grippers which turn the each face by 90 degree either clockwise or counterclockwise in the face plane.The grippers are simply sticks which will be trapped in void 's cube (similar to rubik's cube).The Grippers are rotated by using the d . c . motors.

Sources :

Get a taste from this video http://www.youtube.com/watch?v=jTkNE3O-Ems.

Algorithum will be taken up from internet.

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