

Learning/Deriving Patterns of Solving Rubic Cube By Machine/PC (Machine Learning Based Approach)

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Abstract-There are approximately 315 million students in the world. Puzzles help them for brain development. But in the world full of stress, they might get frustrated if unable to solve the cube. This frustration increases as size of the cube increases. Apart from students there are many people who have dreams to become an expert in cube solving to set the records in live shows. My research aim is, to give shoulders to them dealing with their puzzle challenges more easily and efficiently. The product of current system which provides fix sized cube along with optimum solution to reach the solved state from the current one. The product an online system which provides user defined sized cube along with optimum solution to reach the solved state from the current one. Our system will be composed of three functions user can run successively. First function will allow user to play with cube rotating layers. Second function will be scanning the cube through camera. Third function will be to receive the solution in optimum steps. There will be no data processing on the middle device, rather it will be used for transmitting the data to the web server for each functions with the help of machine learning and optimum path finding.

Keywords -machine learning, Rubik's Cube, Scientific research.

I. INTRODUCTION

Design thinking is about innovating new things by getting inspired by nature and our surrounding. It is about solution to the problems in the existing system in a new way. The design thinking process first defines the problem and then implements the solution, always with the need of the user at core of concept development. This process focuses on need finding, understanding, creating, thinking, and doing. It is great beneficial to learn from nature because through that we discover completely new concept. And such innovations are useful to us in great extent.

For our project on puzzle cube we studied out deeply all the activities going out there, all the people involved, all the living and non-living aspects directly or indirectly related to it. We collected all such information for our project. One of them is records of solving cubes in shortest time by experts in shows. Puzzle cube solving is about solving puzzles cube of the size defined by the user. And my project is a service that will be working on peek technology Machine Learning to find the solution by learning the patterns of the cube as well as to detect real time cube with the help of object

detection. Now according to the output, we will provide the optimum steps to solve the cube. It trains memory when we memorize our (often quite sizable) libraries of algorithms. It trains for our colourful pattern recognition to become precise and accurate. Learning/Deriving Patterns of Solving Rubic Cube by Machine/PC 3 May be in some very broad ways you can generalize some of the strategies of cubing to real life. It has certainly made me better at tackling other 3D puzzles. But in the end, no. I feel no smarter from 6+ years of speed cubing. find simplest, and smallest steps to be followed which can help to solve the Cube from initial state to the final state. he product an online system which provides user defined sized cube along with optimum solution to reach the solved state from the current one.

Advantages

Research addresses a number of key challenges in puzzle solving, including Research will allow users to solve cubes of any size, which is a significant improvement over existing systems, which are typically limited to solving cubes of a fixed size. Research will use machine learning to find the optimal solution for any cube state, which will save users time and effort. Research will

be an online system, which means that users will be able to access it from anywhere with an internet connection. Overall, your proposed architecture for solving user-defined sized puzzle cubes is a well-designed and innovative solution to a number of key challenges in puzzle solving. It has the potential to make a positive impact on the lives of students, hobbyists, and professional puzzle solvers alike.

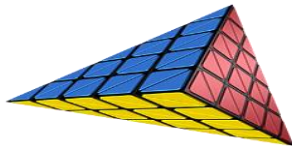


Fig.1 user-defined sized cube

II. STEPS OF ALGORITHM TO WORK

The customer should be able to do the following functions:

- Step1:** Generate a user-defined size of cube.
- Step 2:** Rotate it.
- Step3:** Scan the current position from the physical cube.
- Step 4:** Shuffle the cube.
- Step:5** Solve the cube in optimum number of steps



Fig.2.user define cube sample

III. PROPOSED ARCHITECTURE

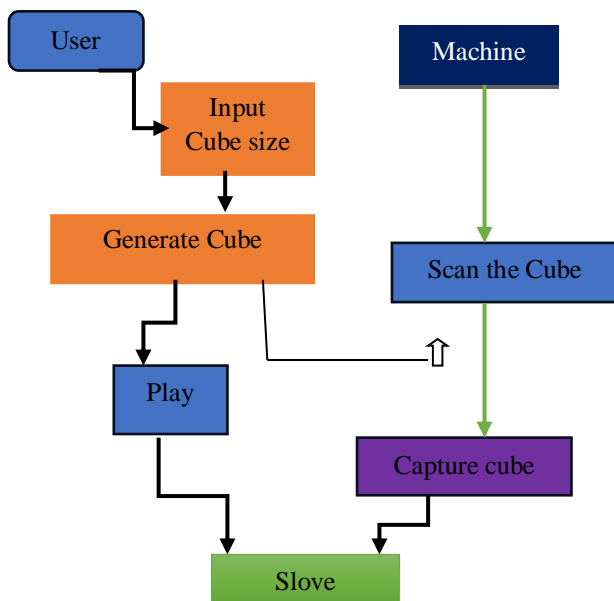


Fig.3 proposed architecture for cube solving

3.1 Optimum solution for user defined size of cube

3.1.1 Description and Priority

This feature means the solution of the scrambled user-defined size of cube in the optimum no of steps.

3.1.2 Stimulus/Response

Sequences As soon as user clicks the ‘solve’ button, the System provides the guide of using the rotation steps which are optimum in number, to reach to the solved state.

3.1.3 Functional Requirements

It is associated with the ‘solve’ function that we are providing whose task is to solve the user defined size of cube

3.2 Accurate scan of the state of a physical cube

3.2.1 Description and Priority

This feature provides user the facility to capture the state of a physical cube so that user can manipulate it and also can find the solution for it.

3.2.2 Stimulus/Response

Equences As soon as user clicks the ‘scan’ button and places cube in front of the camera of the device as guided, the system scans it so that user can manipulate it and also can find the solution for it.

3.2.3 Functional Requirements

Devise must have camera in order to scan the state of the physical cube accurately.

IV. IMPLEMENTATION AND RESULT

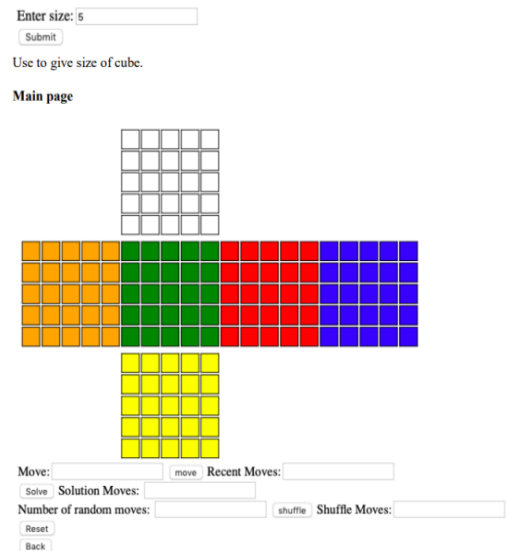


Fig.3 Implementation

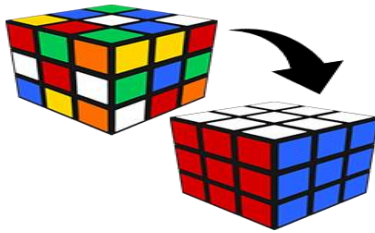


Fig.4 Result

From the above image it can be noticed that the user is able to generate cube of the size he wishes. After that he can type in the moves as per the convention and see the changes in the cube. He can seek solution from the cpu too with the help of that 'Solve' button. Also, he can shuffle the cube by enter no of shuffle moves and pressing shuffle button. 'Reset' button sets cube back to its default position.

V.CONCLUSION

In conclusion, system for solving user-defined sized puzzle cubes is a valuable and innovative contribution to the field of puzzle solving. It has the potential to help students, hobbyists, and professional puzzle solvers alike by providing them with a convenient and efficient way to solve cubes of any size. system addresses a number of key challenges in puzzle solving, including:

Accessibility: Your system will allow users to solve cubes of any size, which is a significant improvement over existing systems, which are typically limited to solving cubes of a fixed size.

- Efficiency: Your system will use machine learning to find the optimal solution for any cube state, which will save users time and effort.
- Convenience: Your system will be an online system, which means that users will be able to access it from anywhere with an internet connection.

Using System user is able to play with the cube of the size he wishes i.e. NXNXN Cube. He/she can seek solution of any cube from cpu with the help of AI.

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