Analysis of Rubik's Cube Solving Algorithms

Project Diary

Meeting 1: September 4, 2021

Objective of meeting

- Is the project idea feasible?
- What are the prior research works?
- What are the basic requirements?

Outcome of the meeting

- Project idea is feasible
- Prior works by – Richard E. Korf, Tomas Rokicki, Thistlewaite, Kociemba.
- Understanding of advanced C++, Graph theory, Branch and bound algorithms.

Next Step

- Gather related works.
- Study all the algorithms thoroughly.
- Find out necessary technical requirements like data structures and algorithms.

Meeting 2: September 12, 2021

Objective of meeting

- Gather related works.
- Discussion of all the algorithms thoroughly.
- Discussion of technical requirements like data structures and algorithms.

Outcome of the meeting

- There are very little to none research papers regarding these algorithms.
- It is very hard to find explanation or implementations of the algorithms except for their original papers.
- Thistlewaite was the first to implement the idea.
- Kociemba's algorithm was improvement over Thistlewaite's algorithm.
- Rokicki's algorithm was improvement over Kociemba's algorithm.
- Korf's algorithm works on 3 laws of Rubik's cube along with pattern databases for heuristics.
- All algorithms work on graph data structures.
- All algorithms work on IDA* algorithm.

Next Step

- Study IDDFS algorithm.
- Study A* algorithm.
- Try to implement IDDFS algorithm over a square of 2x2.

Meeting 3: September 16, 2021

Objective of meeting

- Discuss IDA*
- Discuss Data Structure of the cube.

Outcome of the meeting

- Algorithm of IDA* figured out.
- Expected data structure => 2 separate datastructure => 1-Corners, 2-Edges ()

Next Step

- Study Data Structure.
- Study Thistlewaite's algorithm.
- Figure out heuristic function for thistlewaite's algorithm.

Meeting 2:

Objective of meeting

Outcome of the meeting

Next Step