SUDOKU SOLVER

USING COMPUTER VISION

GROUP 11
MM.ARSATH
19/ENG/006

CONTENT

INTRODUCTION

Image to Puzzle

Solve the Puzzle

APPROACH OVERVIEW

1. **Image preprocessing**
   - Input image is read and processed to find the Sudoku Board
   - Perspective Transform is applied
2. **OCR (Optical Character Recognition)**
   - Split the board to individual cells and preprocess them for OCR
   - A pretrained OCR model is used to predict the digit
3. **Sudoku Grid Preparation**
   - Detected numbers are organized into a 2D array.
   - Empty Cells are converted as 0's
4. **Solving**
   - Backtracking Algorithm is used
   - Optimizing Techniques are used
5. **Output**

CODE STRUCTURE

1. **Read and Load the OCR model**
2. **Image Reading and Board Detection (find_board function)**
   - find_board function convert image to gray scale
   - Apply Gaussian Blur and Adaptive threshold to create binary image
   - Find Contours and iterate
   - If a quadrilateral with four corners is found, it represents the location of the Sudoku board.
3. **Perspective Transformation (get_perspective function)**
   - Extract the sudoku board as a rectangular image.
4. **Splitting board into cells (split_boxes function)**
5. **OCR Prediction (predict_numbers function)**
6. **Identifying empty cells and filling with zeros (find_empty_cells & fill_empty_cells)**
7. **Converting to 2D array (convert_to_2d_array function)**
8. **Sudoku Solving (solve_sudoku & co functions)**
9. **Output and file writing**

DEMONSTRATION

CONCLUSION

REFERENCE

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THANKS

QUESTIONS?