Use Of Jigsaw Puzzle Solving Algorithms In The Real World

Luca Sartore

May 2023

Contents

1 Abstract **3**

2 Introduction **3**
2.1 Classification 3
2.2 Digital vs Real-World Jigsaw Puzzles 3

3 Previous Literature **4**
3.1 General Structure Of The Algorithms 4

1 Abstract

The jigsaw puzzle problem has been in the eye of computer scientists for a while, and some clever solutions have already been found. These algorithms are made to work with a "digital" jigsaw puzzle [F1], but there aren't papers (at least not popular enough to be searchable) that try to apply the solution to a "real world" jigsaw puzzle [F2].
The problem has been tackled by some small projects. But, as said earlier, the process and eventual challenges has never been documented by a paper, this wants to be the first.
As a bonus the paper will also cover the creation of a user friendly app that will be open source and free to use.

2 Introduction

2.1 Classification

This paper will focus on type 2 puzzles. A type 2 puzzle is a puzzle where the position, and the orientation of each piece is unknown.

2.2 Digital vs Real-World Jigsaw Puzzles

There is another important distinction between different types of puzzles. They can be divided into "digital" and "real world" jigsaw puzzles.

Figure F1: An example of a "digital" jigsaw puzzle

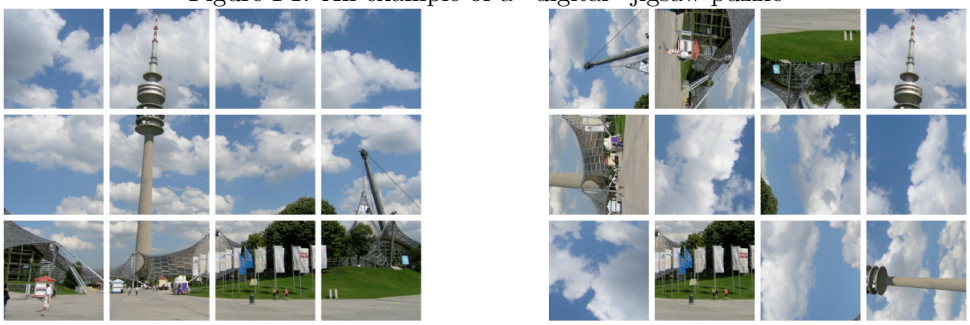
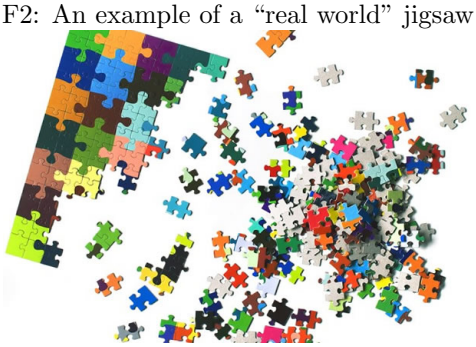


Figure F2: An example of a "real world" jigsaw puzzle



The reason this distinction is important is because, despite the generic concept of the puzzle not changing, obtaining accurate matches of a piece's characteristics is far easier with a digital puzzle, since there are far less things that can go wrong.

Figure F3: An example of what can go wrong when dealing with the real world

3 Previous Literature

This section will analyze 3 different algorithms that have been proposed as a solution of type 2 puzzles. The objective is to understand the strengths and the weaknesses of each one, to build up some knowledge that will be useful for the next section.

3.1 General Structure Of The Algorithms

All the algorithms that will be analyzed are composed of 3 sub algorithms.