Quirkle.com

Hi-performance re-engineering of classic toys and gadgets

Quzzle

Mechanical puzzles

Mechanical puzzles have been around for centuries. What makes a great mechanical puzzle is that it looks simple but is difficult to solve. A good example is the classic puzzle consisting of two twisted linked nails which one must unlink.

On first glance one expects to solve it in seconds. But many people find it much more difficult than it appears. Such puzzles are simple and complex at the same time.

Computer assisted design

Quzzle is not an ordinary puzzle. Quzzle takes the idea of making a complex simple puzzle a step further by using a computer to assist in its design. Inventor Jim Lewis, set a goal of creating the most difficult simple sliding block puzzle in the world*.

Programming language

Mr. Lewis wrote the Computer Assisted Puzzle Analyzer (CAPA) software in Haskell, a so called "Functional" programming language. He went through numerous revisions of the program to allow computation of a solution in an acceptable amount of time. The first version would have taken years of computer time to complete. Subsequent versions progressively reduced the needed computer time by making the program more and more efficient.

Solvability

It is common for puzzle goers to reach a point where they are certain there is no solution. In fact Mr. Lewis tried to solve the final puzzle generated by his program and at first concluded the puzzle was unsolvable. He thought there was a bug in the program. He had an assistant go through the computer solution to verify that the puzzle really was solvable. Sure enough, the puzzle was indeed solvable.

Dad's puzzle

The general type of sliding block puzzle that motivated the Quzzle is a puzzle known as "Dad's" puzzle. Dad's puzzle is shown below:

Just $19.95

Programming the solution

After more than a month of programming and running his programs, Mr. Lewis arrived at a puzzle that is more difficult to solve than any other of its type. Yet it has just nine pieces. Mr. Lewis knows his puzzle is the world's hardest of its type as his computer considered every possible puzzle among ten's of thousands, each having an often long sequence of moves. (Puzzle enthusiast's Henderson and Dogon discovered a small bug in the program that created Quzzle, resulting in a slightly different starting position that adds a few moves. See if you can discover it after solving the classic Quzzle.)

* Types of puzzles considered

Mr. Lewis considered puzzles consisting of blocks one by one, one by two, and two by two in frames up to four by five; where the objective is to move the largest piece from one specific corner to another specific corner. Analyzing small frames of size 3x4 and 4x4 he found even the hardest configurations nearly trivial to solve. He also concluded that frames larger than 4x5 are too hard to solve and take too much computer time to analyze, due to a problem called combinatorial explosion. He also found blocks with a dimension larger than two grid lock puzzles of such sizes.

Theory of sliding block puzzles

For those interested in some of the computer theory of sliding block puzzles, it has been shown that sliding block puzzles are in a class of problems that are the most difficult even

The objective is the move the large piece from one specific corner to another specific corner (a different corner than Quzzle and a different configuration of pieces). Dad's puzzle can be tried using Quzzle, making for two puzzles in one. Dad's puzzle is not easy but it is much easier than Quzzle. The name "Dad's" puzzle supposedly reflects the task of the head of the family rearranging pieces of furniture. The large block represents a grand piano, to be moved to a specific corner of the room. No doubt Dad's puzzle was invented by a mechanical tinkerer who tried many combinations randomly, stopping when he found a "rather" difficult combination. Little could he imagine that a century later every possible puzzle of the type would be scrutinized by a high speed electronic brain - work that could take years to do manually.

Tips

The Quzzle puzzle comes with instructions leading you to a web page with a progression of tips. For example you might want to know how many moves it takes to solve, or whether the first move is up or down. You can reveal tips gradually if you get stuck, or just look at the solution if you want to spoil the fun.

About the Inventor

Mr. Lewis is a puzzle lover that collects mechanical puzzles - many of which were given to him as presents by those who know his passion.

for a computer to solve. These types of problems are called PSPACE-complete. In fact sliding block puzzles can themselves form an unusual type of computer. What does this mean? For example, one could devise a sliding block puzzle that "computes" whether a certain number is a prime number, by having a solution if the number is prime and not having a solution if the number is not prime. It is a rather bizarre diversion in the world of computer science.

Read the press

See what the world famous Economist wrote about Quzzle here.
See what Science Magazine wrote here.
Check the Family Review Organization here.

Quzzle and Quirkle

Quzzle fits into the Quirkle line in that it re-engineers a classic toy, taking it to the next level. There is simply no sliding block puzzle of its type in the world that is simultaneously as simple and complex.

Reseller inquiries and Ad Specialty / Corporate Gift use are welcome.
In case of difficulty with this page please contact us.
Copyright © 2004-2005 www.quirkle.com. All Rights Reserved.