Improving SmartDijkstraPac Algorithm with *Waiting near Power Pills* Strategy

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Abstract

• The maximum score might be 2400~2600 if the pacman focuses only on getting pills at each stage

• It is possible to get additional 3000 score with power pills

• The bonus score is doubled (200, 400, 800, 1600) by catching multiple ghosts

• For each stage, there are four power pills and one can obtain over 14000 score

• Using power pills is a good strategy to get high score
Introduction

• Improving SmartDijkstraPac Algorithm in the sample kit from the competition website

• Based on the algorithm, we added a new logic to yield high score

• Waiting near power pills and catches ghosts
SmartDijkstraPac Algorithm

• The work is proposed by Jonas Flensbak and Geogios N. Yannakakis

• It is a sample controller from the competition site

• It uses Dijkstra algorithm to calculate distance to ghost and it decides safe direction for pacman.
SmartDijkstraPac
Algorithm - Basics

1. Use short-range avoidance to eliminate dangerous directions: If only one direction is safe then choose that direction, or if no direction is safe then choose the least unsafe direction.

2. Use medium-range avoidance to eliminate dangerous directions: If only one direction is safe then choose that direction, or if no directions are safe then choose the least unsafe direction.

3. If any edible ghosts are relatively close, then choose a safe direction to the closest edible ghost

4. Find the safe direction that has the shortest distance to a pill
Proposed Method

• If pacman is nearby power pill, pacman waits until ghosts approach closely.

• Otherwise, pacman is controlled under SmartDijkstraPac algorithm.
Score Comparison

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<th>AI</th>
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<th>Min</th>
<th>Max</th>
<th>Games played</th>
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- Proposed method shows over 10% improvement for average score