

Project Milestone

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Abstract

For my semester project, I will be applying deterministic finite automata to the classic game, PacMan. Specifically, I will be determining the actions of the ghost in different states, as PacMan traverses the map.

Introduction

Growing up, PacMan has always been one of my favorite games. It was instantly a hit game when it was released in 1980, and continues to be a cornerstone in the gaming community. Although it seems like a simple game, the logic behind it presents a challenging scope of options that were carefully selected to create an AI that feels almost too responsive. However, that is all a part of what makes PacMan so encapsulating.

Detailed System Description

There are four different states that the ghost assumes, either wandering, chasing PacMan, avoiding PacMan, and returning back to base. While PacMan is not visible to the ghost, it will be wandering. While PacMan is in view, the ghost will begin to chase PacMan. If PacMan eats the dot, otherwise known as the power pellet, the ghost will begin to avoid PacMan. When eaten by PacMan, the ghosts will return back at base.

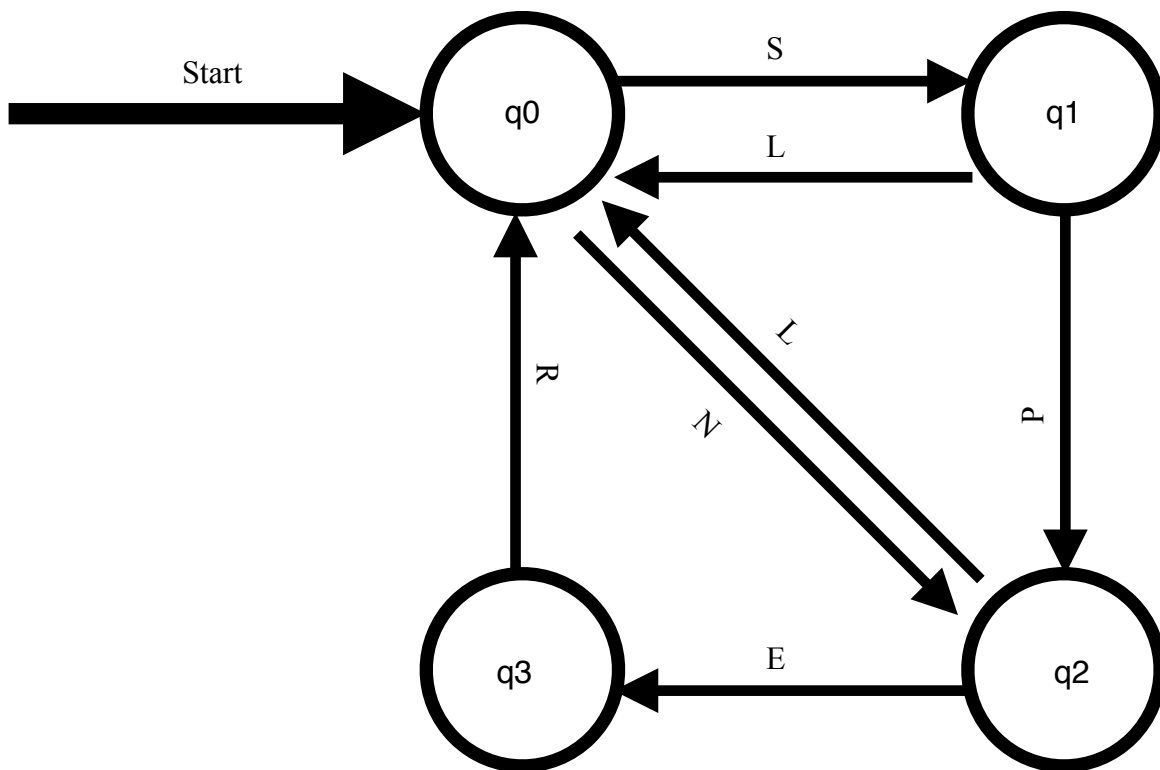
Requirements

There are not many physical requirements of the system resources. PacMan is a very lightweight applications that basically runs on a system of yes and no, or better yet, 1s and 0s.

Literature Survey

With PacMan being an extremely popular game, there have been many different versions over the years. With constant changes and improvements, almost every aspect of the game has been covered. I will be heavily focusing on the movement of the Ghosts and their correlation to PacMan himself.

User Manual



Symbol Table

S - PacMan Spotted

L - PacMan Lost

P - Power Pellet Eaten

E - PacMan Eaten

N - No Power Pellet Effect

R - Return to Base/Wandering

Ghost Transitions

q0 - Wander the maze

q1 - Chase PacMan

q2 - Run away from PacMan

q3 - Return home

When the user begins to play PacMan, the ghosts start at q0, wandering the maze. If they spot PacMan, they begin to chase him. Once PacMan eats the power pellet, the ghosts begin to flee. If PacMan eats the ghost, they return back to base, or if the power pellet runs out, then the ghosts begin to wander again until they spot PacMan. If PacMan is still in sight when the power pellet runs out, they will begin to follow him again.

Conclusion

Essentially, it is a big loop that creates the game of PacMan. With only four states, PacMan provides a surprisingly rich experience, that has near infinite playability. Not only that, but PacMan has also been an influence to other popular games, such as Donkey Kong, Super Mario Bros, and Sonic the Hedgehog. For such a simple game, it had such a significant impact on many generations. I think it will make for the perfect semester project to dive deeper into the details behind the masterpiece game.

References/Bibliography

<http://web.cs.ucdavis.edu/~rogaway/classes/120/spring13/eric-dfa.pdf>