Geometry Friends

Rectangle Track with an A* approach

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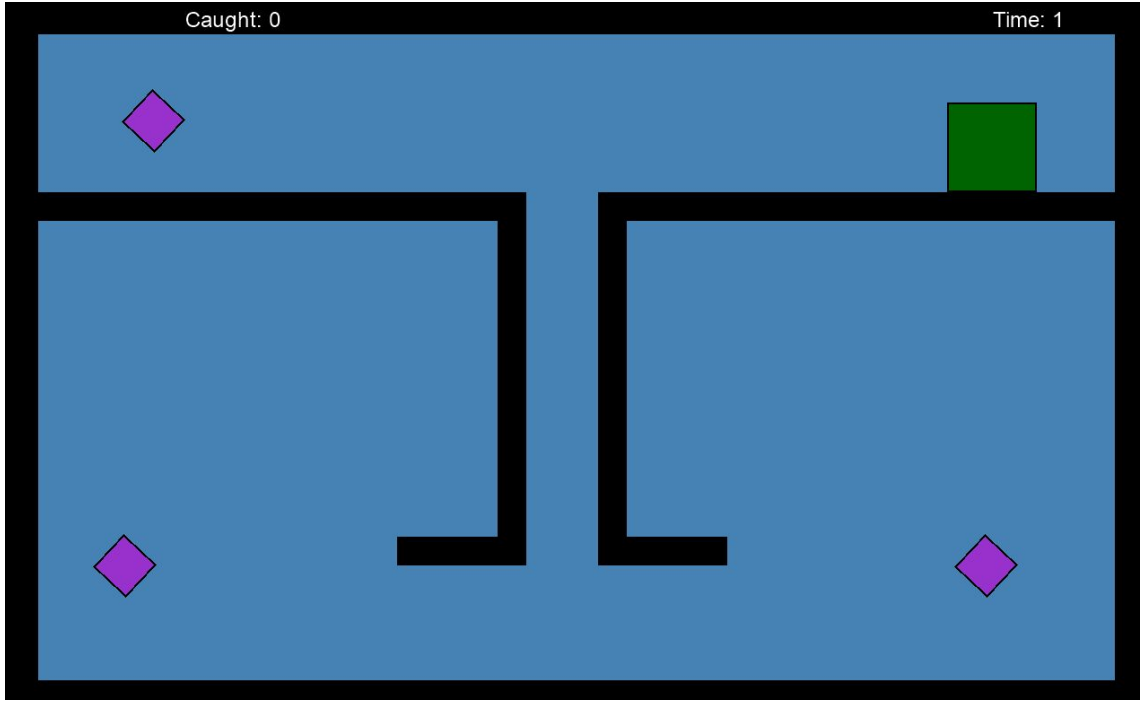
Rectangle Track

Every level consists of :

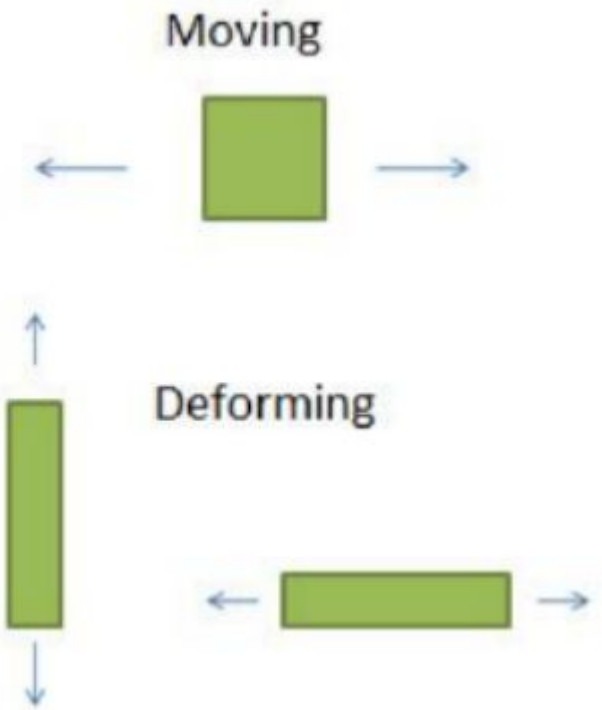
- The Agent
- Obstacles
- Collectibles



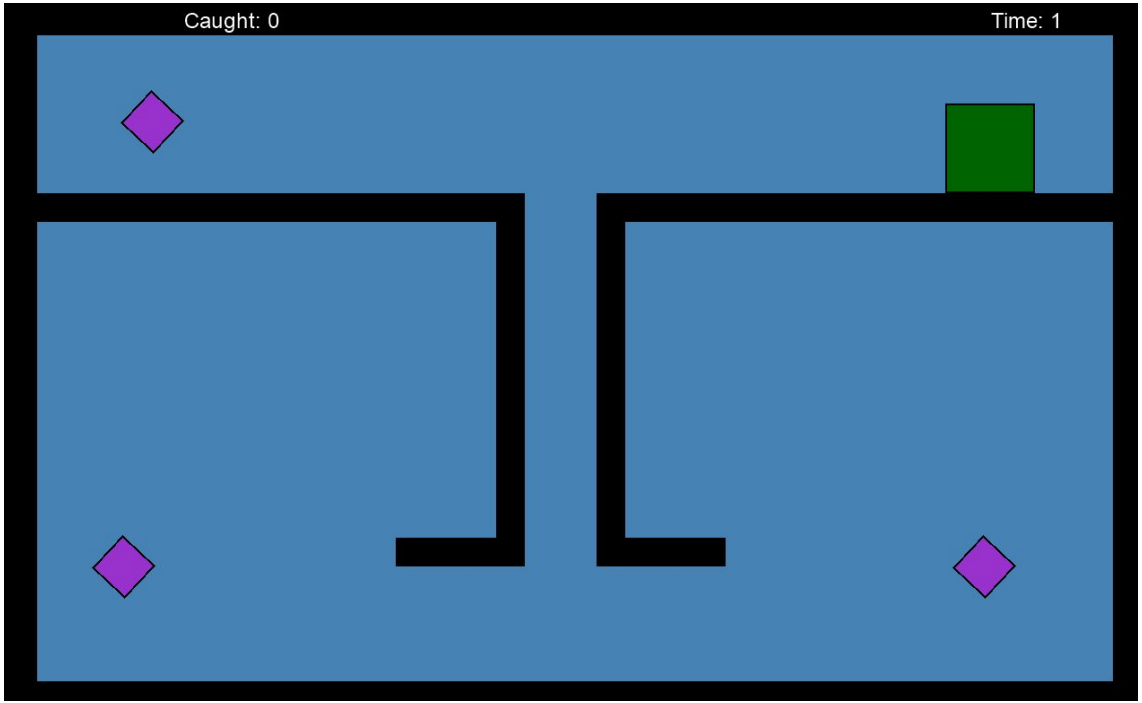
Rectangle Agent’s Actions

The Agent can:

- Move Left or Right
- Morph Up or Down



So How Will the Agent **Navigate** through the Level?



1st Step: **Discretization**

- ❖ Very Large state space and Action space

So:

- ➔ The map is converted to a 1200 x 720 pixel map
- ➔ Easy to traverse through code
- ➔ Necessary for navigation

2nd Step: **Pathfinding** Algorithm

- ❖ An Optimal and Fast navigation algorithm was necessary

- ➔ A* was considered the best
- ➔ Euclidean Distance was used as the Heuristic

3rd Step: **Generate** Valid Kid Nodes

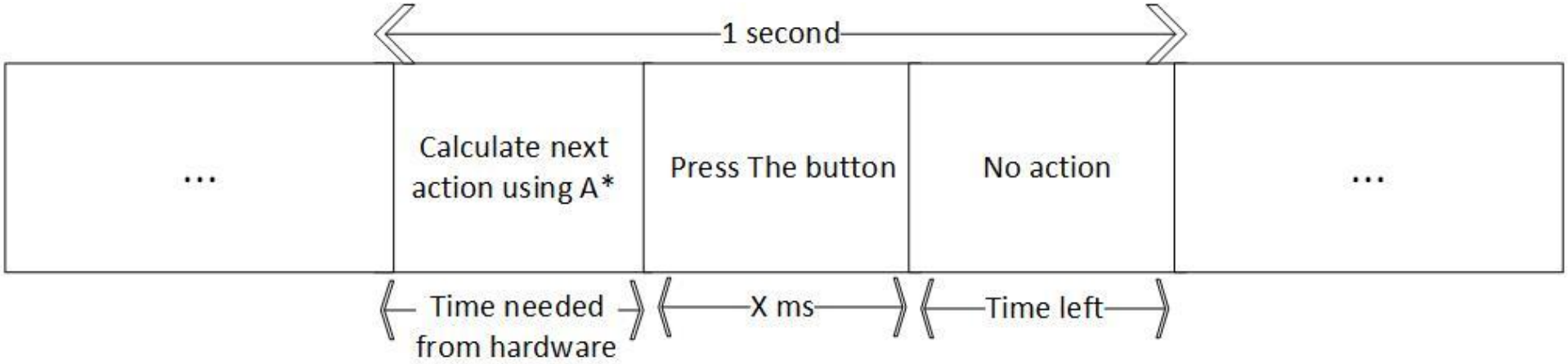
- What happens when the agent is **over a gap**?
- What happens when the agent **collides with an Obstacle**?

➔ Need to create **custom** physics Simulation functions using the pixel map

Summing Up

- The game has **continuous** input ,so every action builds momentum
  - This is creating uncertainty at the Agent's calculations

So the solution:



Results

- All levels were **completed** in a decent amount of time

- Although, sometimes Agent might get stuck making it impossible to finish

The End

Thank you!

Any Questions?