Circle the cat

AI based game

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# Overview & Methodology

This is mainly an AI-based game but could be a two-player game. It consists of a bee hive-like grid, with a cat located in the middle of it. The player will try to circle the cat by tapping the tiles around it, but with each tap, the cat takes a step forward trying to escape the circle using an AI algorithm to try and take the shortest path to get out of the grid.

# Used Technologies

It was originally implemented with Flutter but was turned to Python.

Used IDE: VS Code & PyCharm

# Plan

First, we will create the Two-player version of the game, one player will act as the cat trying to escape and the second player will try to trap the cat by tapping on the tiles surrounding it. Second, we will create the player vs. AI version, which will be the cat using an AI algorithm to calculate the shortest path to escape the grid and the player will try to circle it.

Circle the cat

Agent (PEAS)

| Performance measure | Environment | Actuators | Sensors |
| --- | --- | --- | --- |
| Winning rate, speed | Tiles, Human player | Screen display | Mouse clicks |

Environment (ODESDA)

| Observability | Deterministic | Episode | Static | Discrete | Agent |
| --- | --- | --- | --- | --- | --- |
| Fully observable | Strategic | Sequential | Static | Discrete | Multi-agent  (Competitive) |

Agent program type:

Utility-based reflex agent.

Problem formulation

# Initial state

* The cat is located in the middle of the grid.
* All the circles are unselected.

# Successor function

* Selecting the circles to trap the cat.

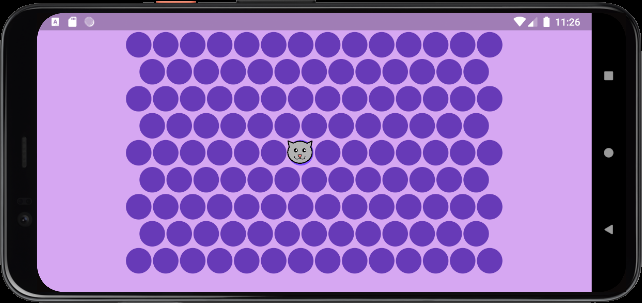
# Goal test

* The cat is trapped with selected circles.

# Path cost

* Each circle selection costs one.

Game tree



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