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CSE 3521

Homework #2

1. Choose an interesting task/domain that you are familiar with (not listed in the book or discussed in class!) and write a PEAS description of an agent for that task. Next, characterize the environment (e.g., observable, deterministic, episodic, static, continuous, single agent) and justify your individual characterizations.
    a. Task: Get vanished from Big Brother's Telescreen.
    b. Performance Measure: Completely remove me from all video recording, find potential camera which can used to track the target, can be done in short amount of time.
    c. Environment: Anywhere covered by surveillance cameras.
        i. Observable, episodic, continuous
        ii. Since the surveillance cameras are everywhere, therefore, we need to learn the location of them. Also, there must be multiple cameras at different locations so my track can be exposed.
    d. Actuators: Track, remove, compare, replace, confusion.
    e. Sensors: Camera, GPS, altitude, keyboard, digitizer.
2. Give the initial state, goal test, actions/operators, and path cost for the following description. There are several possible formulations for the problem, with varying levels of detail. Pay special attention to different path costs for various actions, and conditions for when those actions are valid. The main thing is that your formulation should be precise and "hang together" so that it could actually be implemented.
    a. You have to color a complex planar map using only four colors, with no two adjacent regions to have the same color.
        i. Initial State
            1. Empty map with countries borders.
            2. There are four colors present.
        ii. Goal Test
            1. The map has only four colors.

2. No two adjacent regions to have the same color.
3. All partitions are colored.

iii. Actions/Operators

1. Coloring (started from empty): Randomly select one color from four of them, and fill it in, then remove it from the option.
2. Find surrounding color and fill color in: Reinitialize the color option, check the border of that partition, remove surrounded color, then fill the color in.
3. Redundancy: Randomly select ¼ colored space, and check the neighboring color, if the color has been used twice, then correct it and rerun the coloring process.

iv. Path Cost: $O(1)$

1. Finding surrounding partitions: $O(4 - i)$