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# Influence Maps Ms Pacman Controller

CEC 2008 Ms Pacman Competition Entry

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## Overview

This Ms Pacman controller was developed using the web based implementation of the game at <http://www.webpacman.com/mspacman.htm> and the toolkit developed by Simon Lucas.

## Running the Controller

To run the Ms Pacman controller, simply make sure that the following variables in the MsPacInterface class are set to the version of Ms Pacman being used. Once the variables have been set, simply run the MsPacInterface class.

## Screen Position

Adjust left and top to give the position of the Ms Pacman application, this is measured from the top left of the screen. Adjust the width and height to suit the Ms Pacman application being used.

## Colours

Different versions of the game appear to use different colour settings for game objects. Currently the colours are defined to work with the web based version of the game. If colour adjustment is required, change the following colours to suit the version of Ms Pacman being used.

- blinky
- pinky
- inky
- sue
- pacMan
- edible (this is the colour when the ghost is edible)
- changing (this is the colour when the ghost is changing from edible)
- pill

In order to use the correct integer value for the game, apply the following algorithm.

- Find the hex representation of the colour
- Negate this hex number
- Convert the last 6 hex digits to an integer
- Make this integer negative
- Add one or subtract one from this number to fine tune the adjustment

To have the agent run at it's best, make sure in the captured screen representation, the bottom row of dots is close to the bottom of the capture window.

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## ***Theory behind the controller***

The controller is based on an influence map, with each game object having an influence on Ms Pacman's movement at each step. The influence of an object decreases the further the object is away from Ms Pacman. The objects that have been identified in this game are as follows:

- Ghosts
- Edible Ghosts
- Changing Ghosts
- Pills
- Power Pills

To assure that ghosts do not overshadow the pills and vice versa, the following adjustments to the influence calculation have been applied:

- Ghosts have less affect the more pills that are eaten.
- Individual pill influences grow as the amount of pills decrease.

The sum of each object's influence is calculated for each position immediately adjacent to Ms Pacman, with the best of these possibilities being the direction to take.

The amount of influence an object has is defined in the AttributesGrid class and can easily be changed to notice the effect of differing influences from objects. For example, changing the scale factor of the ghosts to 0 will remove the detection of ghosts.

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