Read Me

This file is intended to show and explain the purpose of the project, what it does, and what capabilities it gives to those who use it.

This project represents a Pacman-style game. There are pacmas and fruits. The purpose of the pacmas is to eat all the fruits on the board.

The game board is a map of Ariel University when each pixel point on the map is mapped to a GPS point.

Each pacman has a speed of movement (in meters per second) and an eating radius (in meters) that defines the minimum proximity of pecman to fruit to eat it.

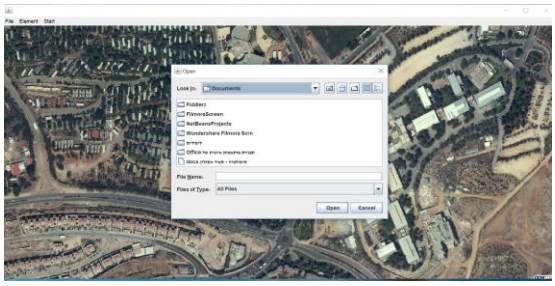
This game is created in two possibilities

1. Adding the elements by clicking the mouse

2. Reading files from csv format

The progress of the game:

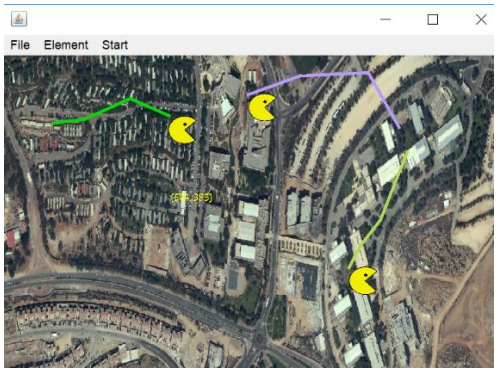
There is a menu that will allow you to upload a game file (csv) by clicking on file menu and then you need to click on "Add csv" and the File Chooser appears on the screen .



Another option is to create a game with the click of the mouse to put pacman and fruit on the screen, you can switch between them in the "Element" menu . then you need to save the game file.

After you chose one of this option you need to run the game by clicking "Start" menu.

When the Pacmans game starts, each one of them will start to move. Once the pacman reaches the fruit of his eating radius, the fruit will disappear from the screen. After all the Pacmans finish their route, various lines will appear on the screen to mark the path the Pacmans have passed.



After the run, the runout can be saved as a KML file with time signatures to allow easy viewing in Google Earth. To do that you need to click on "convert to kml". The kml file will be created in the project folder.

System structure

1. GIS

Elements that contain two types : Pacmans and fruit . They have common characteristics such as location, id. And various characteristics, for example fruit has weight and Pacmans has speed and eating radius.

2. MyFrame

A graphical class that allows robots and fruits to be displayed on the map, showing the activity of the algorithms on the board (by eating the fruits that are in the Pacmans path and displays the path routes using lines.)

3. File format

This package is about File Conversion. its capabilities to create a game from a csv file and convert from a game object to a csv file .

Another class, Convert2Kml, converts a game file into a kml file with time signatures to allow viewing in Google Earth with the time when the fruit was eaten by the Pacmans.

4. coords

A basic coordinate system converter. This package supports this method:

find the 3D vector between two lat,lon, alt points ; Adding a 3D vector in meters to a global point; convert a 3D vector from meters to polar coordinates; Calculate distance

4. Solution

This package contains the algorithm for calculating the path of the Pacmans.

The algorithm we have applied is a greedy algorithm that is passed on to all the Pacmans and asks for which pakman what the most valuable fruit. Once the point is found it is added to the Pacmans path and then we continue to the next fruit.

In this class there is a function that calculates the total time it took for all the Pacmans to finish the fruits.

For each pacman is calculated a path that contains all the fruit through which it passes. In addition, the calculation is made to find the time when the Pacmans will reach each fruit.

In the path class, there is a function that receives some time input and returns the relative point on the path in which the Pacmans was at that time.

In converting from Java to kml we used Jak library:
https://labs.micromata.de/projects/jak.html