Range Sum Heat Map – User Manual

Steps to be followed to execute the program:

In order to start execution of the program either only the source code or the jar file (both provided in the repository) is sufficient. No additional files are required.

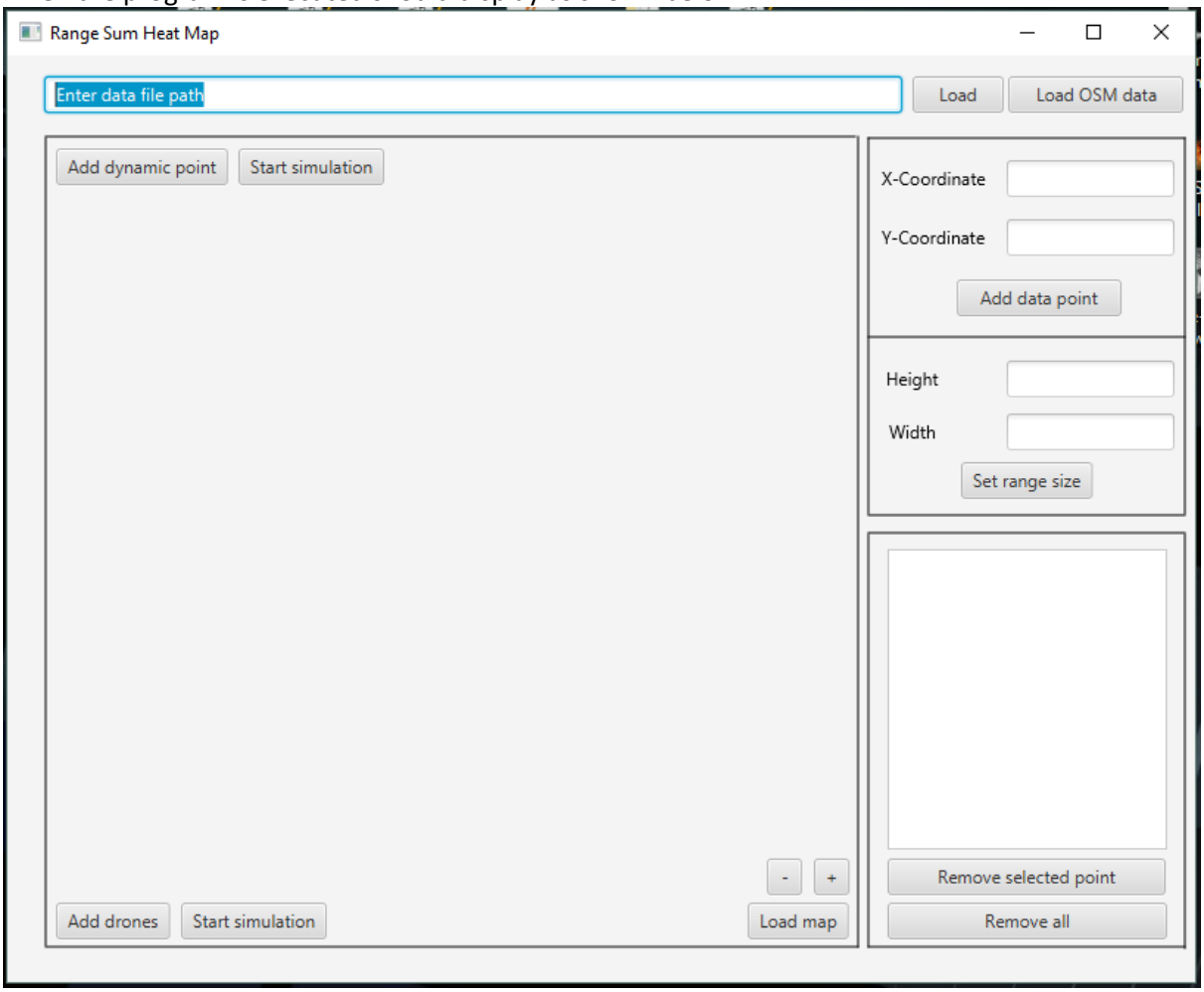
1. Using the Source Code

1. Download the source code from the repository.
2. Using an IDE import the source code to a new project.
3. Execute the program using the class: 'Main.java' (which contains the main method).
4. If an IDE is not available, using command prompt compile all the class provided in the project path: **RSHeatMap\src\application** and then execute **Main.class.**

2. Using the provided jar file

1. Download the jar file from the repository.
2. Double-click the jar to start the program execution.

When the program is executed should display as shown below:



Adding data points to the canvas

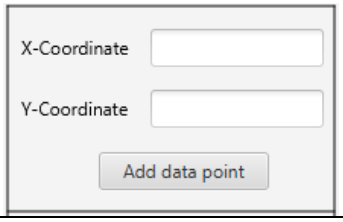
There are 4 methods available to the user for adding data points to the canvas:

1. Clicking on the canvas

Clicking on anywhere on the canvas will generate a rectangle with the default dimension of 100x100, with the point of interaction with the canvas as the centre.

2. Add data point by specifying the coordinates

The following interface provides can be used to add a data point. Specify the X and Y coordinate (centre of the rectangle) and click 'Add data point' in order to draw a rectangle on the canvas. The dimension of the canvas in general would be the default dimension (100x100).



3. Load data points from a file

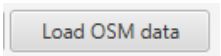
A file which lists the required data points can be used to load multiple data points in one go. This can be performed by:
a. browsing and selecting the file from anywhere in the computer being used, or
b. by entering the full path of the file in the text box provided.

The data point file should be of the following format:
a. x-coordinate and y-coordinate should be separated by a comma (,).
b. There shouldn't be spaces between the coordinates other than the delimiter.
c. Each point should be separated by a new line.
Eg:

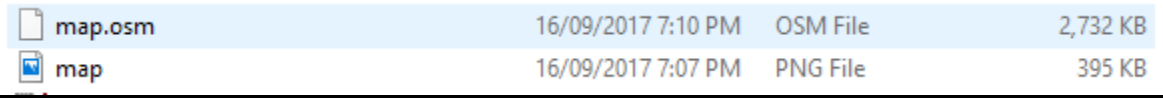
```
533,105
534,105
535,105
536,105
537,105
538,105
```

4. Load data by importing data from OSM

Data can be imported by selecting an extracted from from OSM using the 'Load OSM data' button provided in the inferace on the top right corner.

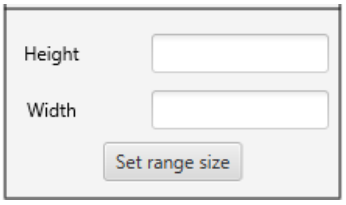


The only condition regarding this upload is that a screenshot of the map area being imported should be kept along with the OSM data with the same filename (this condition is provided in order to make the user upload the map data with a picture of the map – in order for the data to make sense).



Changing the dimension of data points

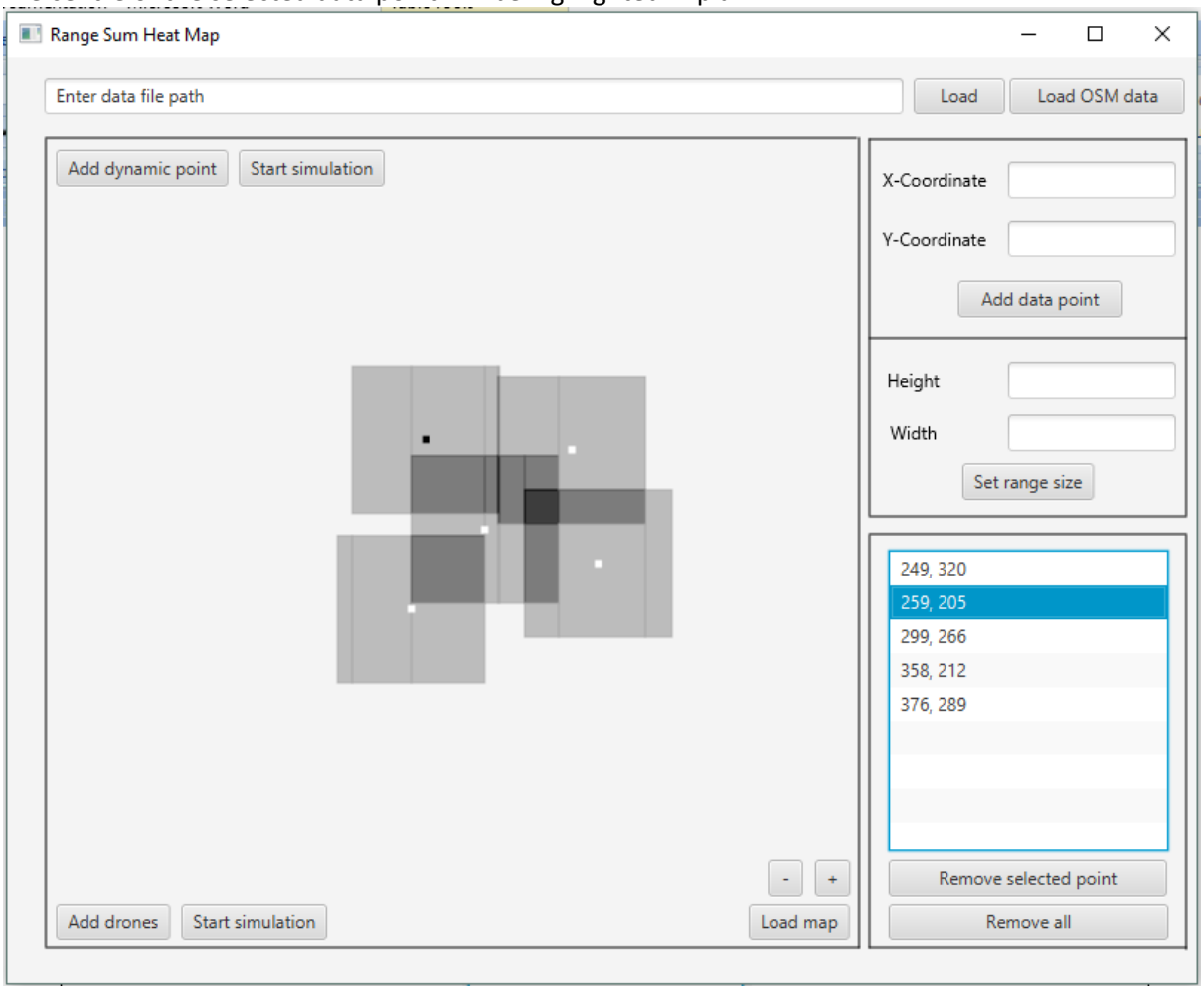
In order to change the dimension of the data points on the canvas, the following interface is provided:



Once the dimension is changed, all the existing data points will also be modified with the user defined dimension. Every data point being uploaded will also follow this dimension set.
The user can omit either height or width if they don't require any change to that particular dimension.

Selecting a data point

In order to select a data point a list of existing points on the canvas is provided on the bottom right corner of the application. Any of the data points can be selected by clicking on the coordinate belonging to it.
The centre of the selected data point will be highlighted in plan.

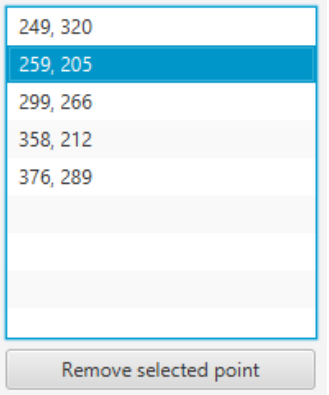


Removing data points

There are 3 ways for removing data points from the canvas

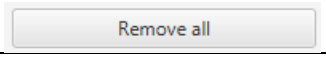
1. Select and remove data point

From the list of data points given in the list (bottom right corner) of the application, any given point can be selected and removed using the 'Remove selected point' button.



2. Remove all points from the canvas

The 'Remove all' button provided below the list can be used to remove all the points from the canvas in one go.



3. Right clicking in the data point

Any data point can be removed from the canvas by right-clicking on the centre of that data point. There is an area of 3x3 provided for the user around the centre of the data point which can be used for this purpose (in order to make it easier for the user to delete the point)

Load map

There is an option provided to change the background image of the canvas to any map of size: 500x500 pixels. If a larger map is provided, it will be cropped to fit the size.

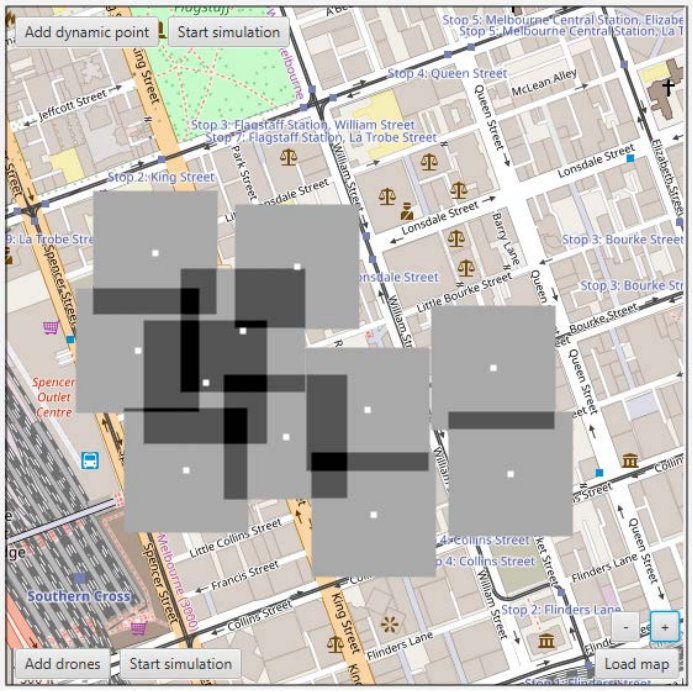
Even though it is mentioned as a map, the user can upload and change the background to any image of the specified size.

Change the opacity of the data points

There are two button given in the bottom right corner of the canvas:

The '-' button decreases the opacity of the data point and will make the background image/map more visible.
The '+' button increases the opacity of the data point and makes the background image less visible.

Maximum opacity:



Minimum opacity:

Simulating a drone

1. Adding drones

A drone can be created by clicking the ‘Add drone’ button on the bottom left corner of the canvas.
1. Click on the ‘Add drone’ button to start adding a drone.
2. Any left click performed in the canvas after (Step 1) will be considered as marking the trajectory of the drone.
3. Right-clicking on the canvas will finalise the coordinates to be covered by the drone.
4.a. After this step, if another left click is performed on the canvas, if will add another drone. Then Step 2 will be performed again.
4.b. After Step 3, if another Right-click is performed on the canvas, all the drones will be finalized and the application will go back to its normal state. (i.e. left click will add data point on the canvas and right click will delete a data point)

2. Simulation

1. Click on ‘Start simulation’ in order to start moving the drone.
2. The drone moves based on the movement of mouse of the canvas.
3. If the movement of mouse is stopped, then the simulation pauses.
4. The simulation cannot go backwards. I.e. once a point is passed, it cannot be revisited unless the trajectory of the drone allows it to.