School of Electronics and Computer Science
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Runway Redeclaration Tool - User Guide

COMP2211 Software Engineering Group Project

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Software description

The Runway Re-declaration Tool is a Java based program designed to assist with the presence of obstacles on an airport runway. The tool is designed to be faster than the common paper based system and provides an informative view of data.

Getting started

From now on we will be referring to pictures of the software detailed in the appendices e.g. fig1.

Upon starting the application, you will be greeted with an empty table, a space for the visualization of the runway and some dropdown boxes to decide the specific objects to be used in the calculation (fig1.1). This is the homepage.You can switch from table and list view to display only maps, by clicking “Only Map”(fig1.2). The software comes with a few preloaded airports, runways, planes and obstacles.

Fulfil a calculation

To complete a calculation simply select from the list of predefined objects or create your own (refer to “Create an object”). Then insert the obstacles distance from centreline and distance from threshold. Next click calculate and a new row with your calculation details will be displayed in the table. To display the visual, click on the row for your calculation in the table (fig2).

Navigating the visual

The visualisation contains a few features in and of itself. The data on the visual, is easily identifiable however there are a few things that might need explaining (refer to “Definitions”). When the visual is displayed, you are automatically sent to the top down view (fig3). This has the details of the calculation. To display the side on view simply click the button “Side on”. The data here is mostly the same however a sideways view of the runway is shown. The default setting for side on view is the take-off view (fig3). You can switch to landing view by clicking the button “Landing view” (fig4) and can switch back by clicking “Take-off view”.

The top down and side on views contain a 3d model of an airplane which points in the landing/take-off direction. Both views also contain a button - “Colour blind mode” (refer to “Additional features” subsection “Colour blind mode”).

Adding objects

Adding airports

Navigate to File -> Airports. A pop-up tab is opened displaying pre-loaded airports (fig5). To add an airport, enter the name and airport code then select “Add”. Your airport will be displayed in the table. To delete an airport, click an entry in the table and select “Delete”. Close the tab once finished.

Adding planes

Navigate to File -> Planes. A pop-up tab is opened displaying pre-loaded planes (fig6). To add an plane, enter the model, blast protection, length and wingspan then select “Add”. Your plane will be displayed in the table. To delete a plane, click an entry in the table and select “Delete”. Close the tab once finished.

Adding obstacles

Navigate to File -> Obstacles. A pop-up tab is opened displaying pre-loaded obstacles (fig7). To add an obstacle, enter the name and height then select “Add”. Your obstacle will be displayed in the table. To delete an obstacle, click an entry in the table and select “Delete”. Close the tab once finished.

Adding runways

Navigate to File -> Runways. A pop-up tab is opened displaying pre-loaded runways(fig8). To add a runway, first select an airport you would like to add it to. Next select the runway bearing, runway type and its position marker. Enter the lengths i.e. TORA, TODA, ASDA, LDA and runway length then select “Add”. Your runway will be displayed in the table. To delete a runway, click an entry in the table and select “Delete”. Close the tab once finished.

XML

Import XML

Navigate to File -> Import XML. Click import (fig8) and use the file explorer to find your xml file (fig9). Click open. The objects from your XML will be displayed in the program. To view them simply go back to home and click the relevant dropdown boxes to view your objects.

Export XML

Navigate to File -> Export XML. A file explorer window will be opened. Simply select the name and where you want to store your XML file and click “Open”. Your XML file is now saved there.

Additional features

Dark/light mode

Navigate to Setting -> Colour Scheme -> Switch Dark/Light Mode. The default is dark mode. Navigating here will change the software to light mode. To revert to dark mode, repeat the steps.

Colour blind mode

Navigate to Setting -> Colour Scheme -> Colour-blind Mode. Navigating here will change the appearance of the program to better suit individuals with colour blindness.

It is also possible to change the visual to colour blind mode. On both views (top down and side view), you can click the “Colour Blind Mode” to switch between colour blind mode and back.

Definitions

●**Take-Off Run Available (TORA)** - the length of the runway available for take-off, under normal conditions.

● **Take-Off Distance Available (TODA) -** the length of the runway (TORA) + any clearway. This is the total distance an aircraft can safely utilise for its take-off.

● **Accelerate-Stop Distance Available (ASDA) -** the length of the runway (TORA) + any stopway. Used in case of an aborted take-off.

● **Landing Distance Available (LDA) -** the length of the runway available for landing. Starts at the threshold and may be displaced by an obstacle or permanently.

● **Runway End Safety Area (RESA) -** An area at each end of the runway intended to reduce the risk of damage to an aircraft by overrunning/undershooting the runway.

Known Issues

When opening the “Only map” view. Multiple maps are displayed (fig11). This can be fixed by resizing the window by any amount or when clicking an entry in the table, double click instead of single clicking a row.

Appendices

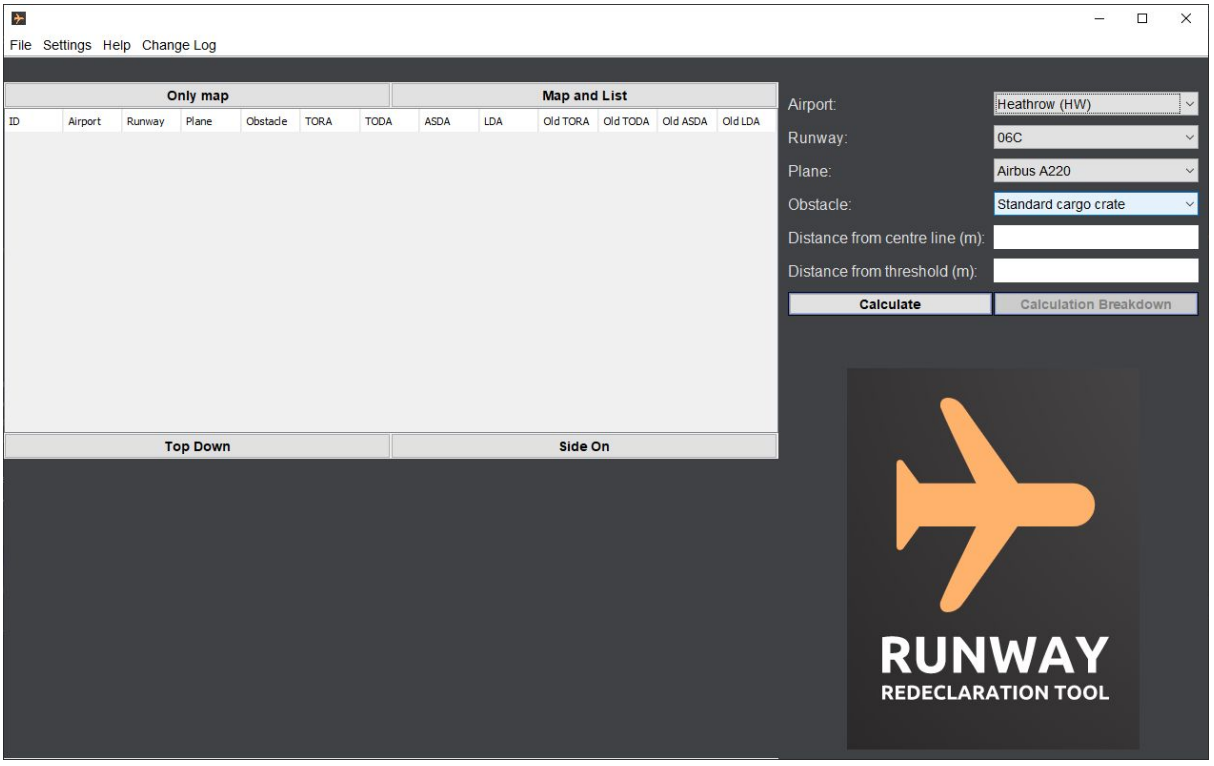

Figure 1.1

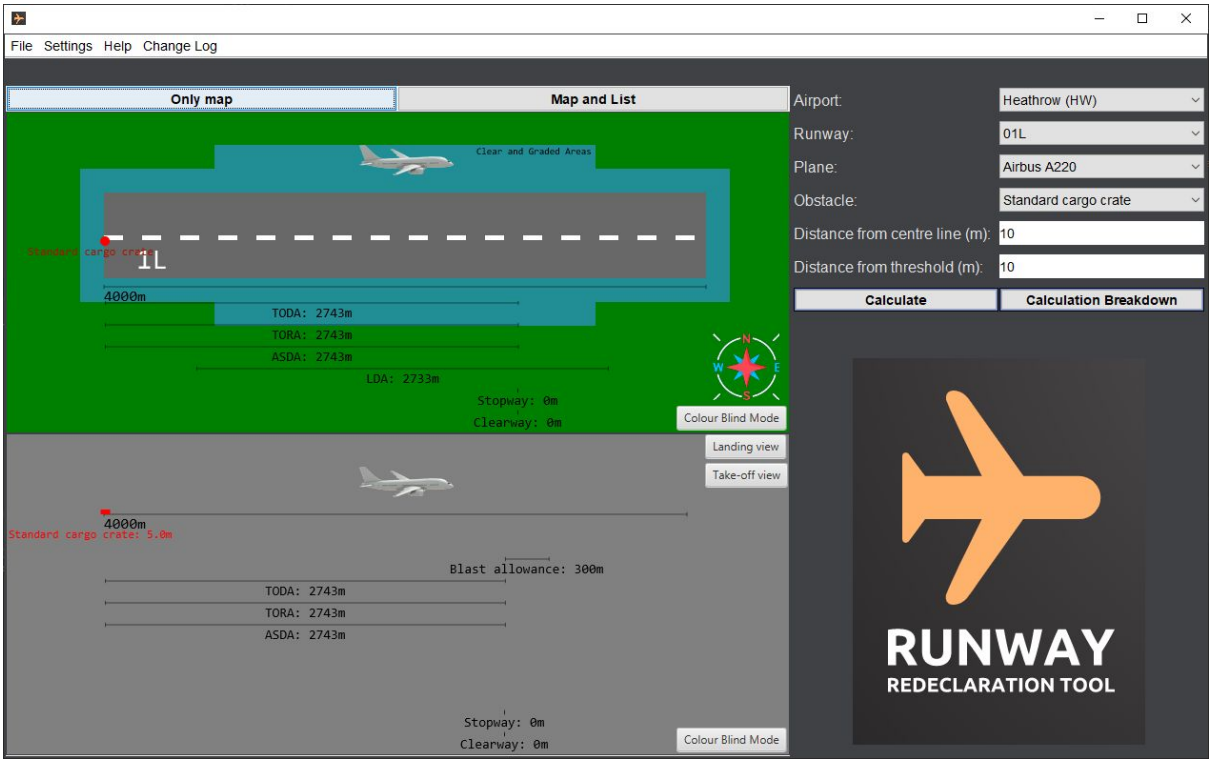

Figure 1.2

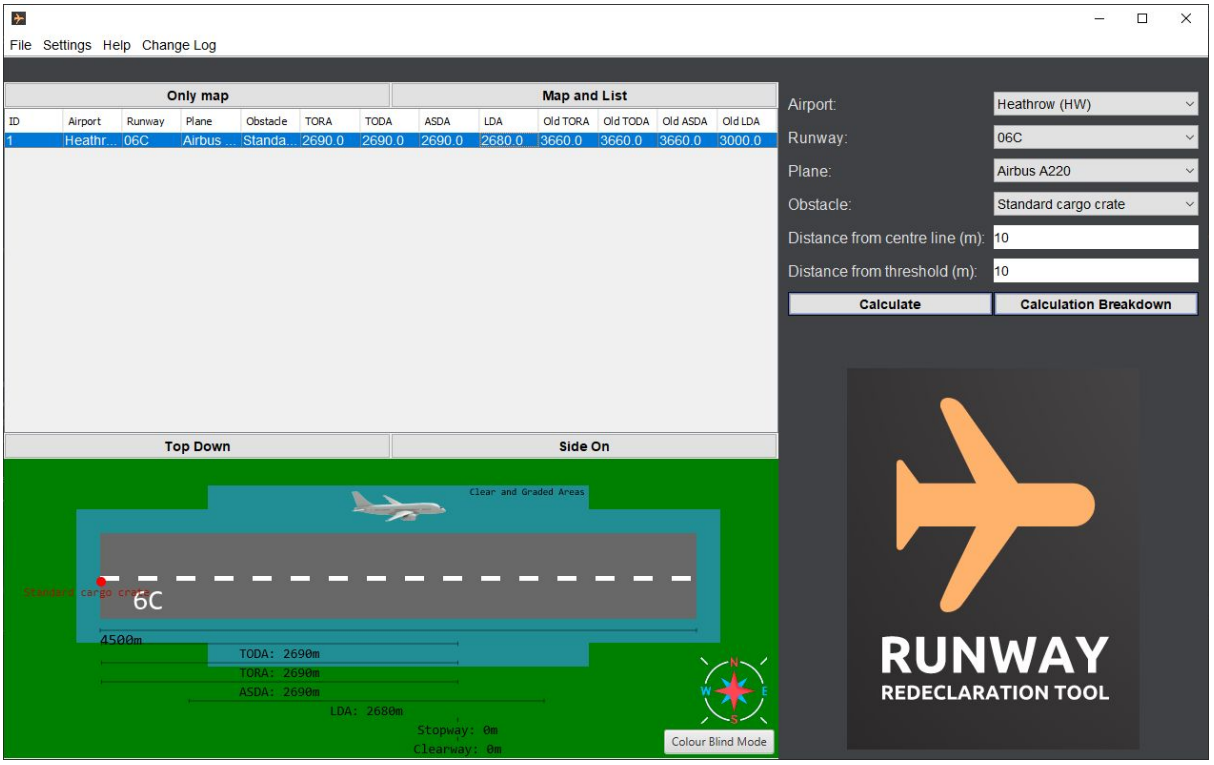

Figure 2

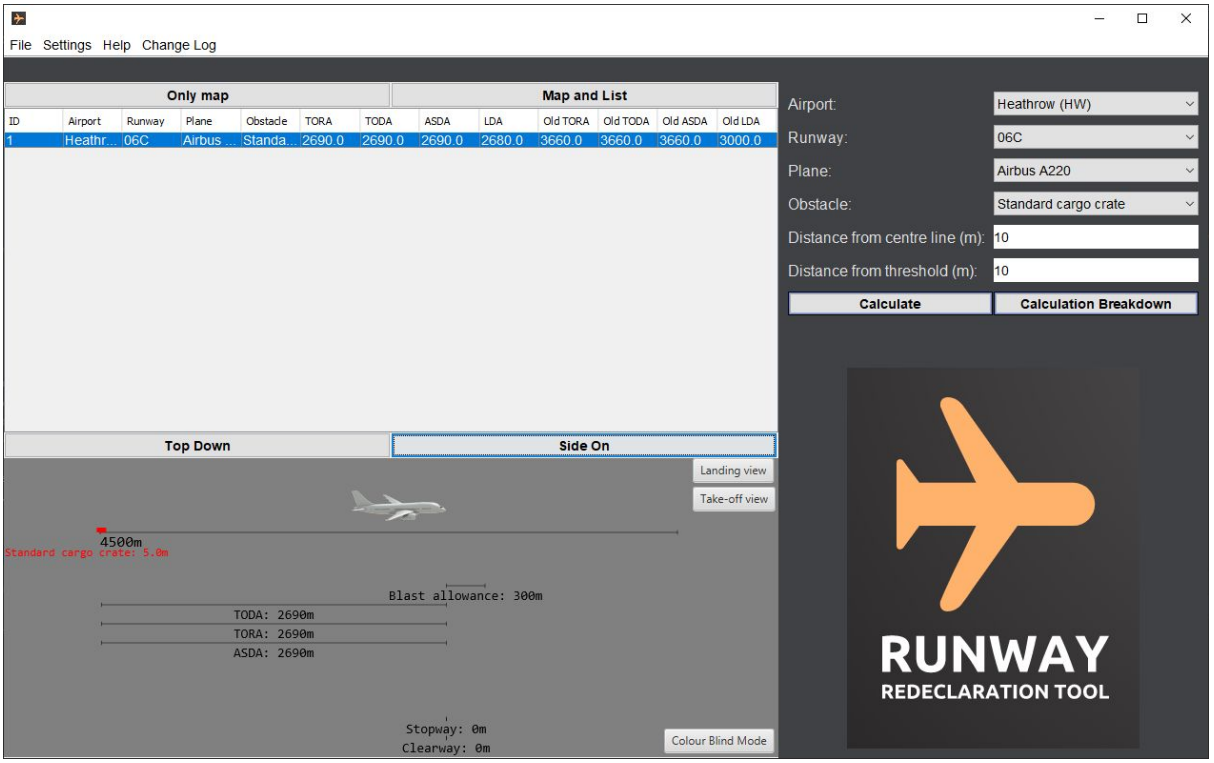

Figure 3

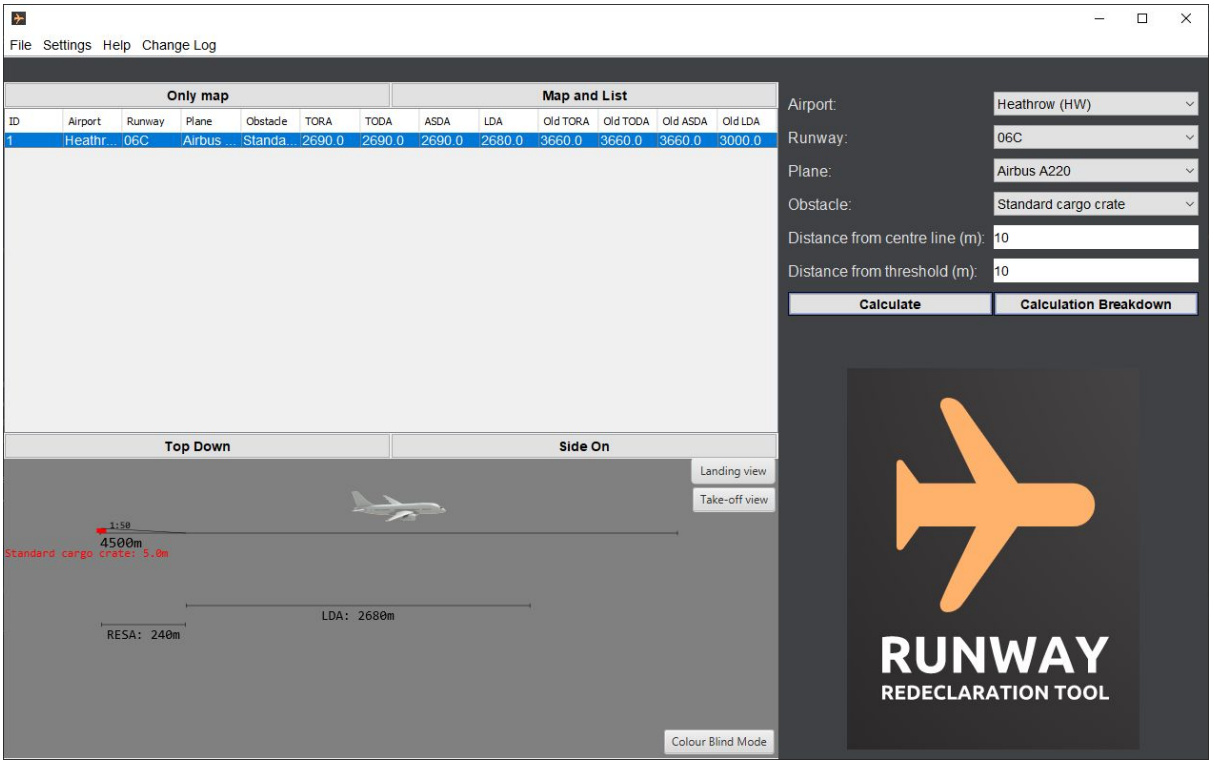

Figure 4

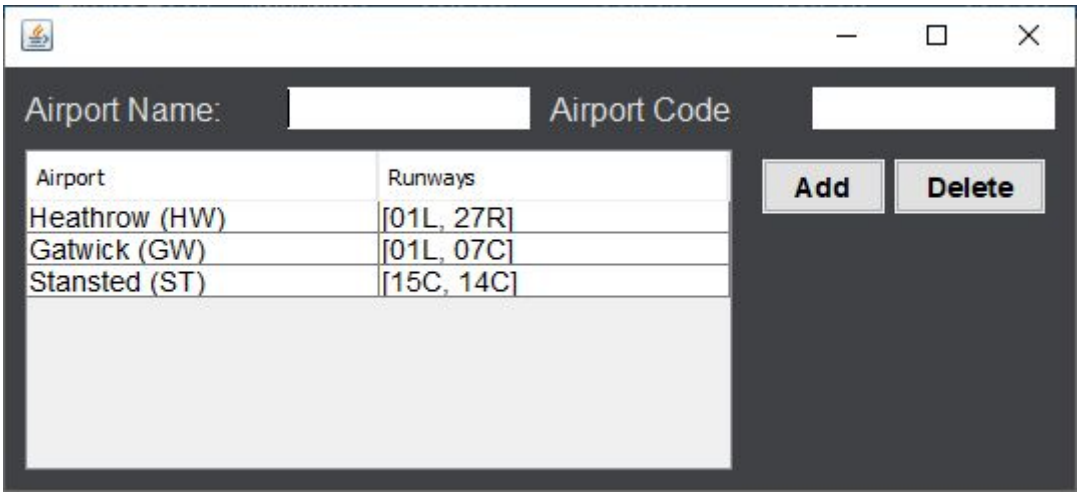

Figure 5

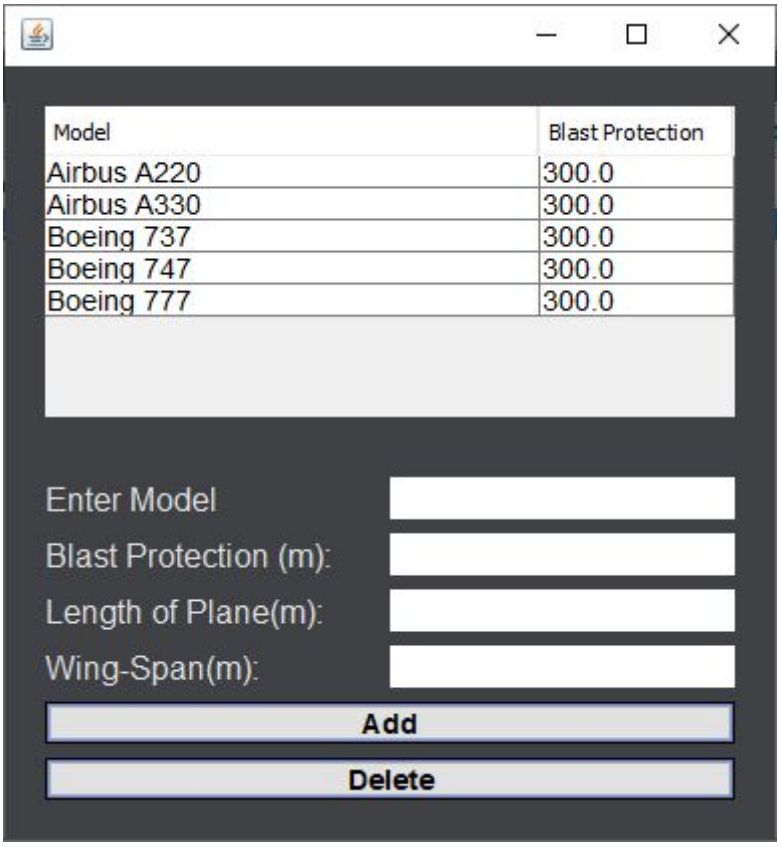

Figure 6

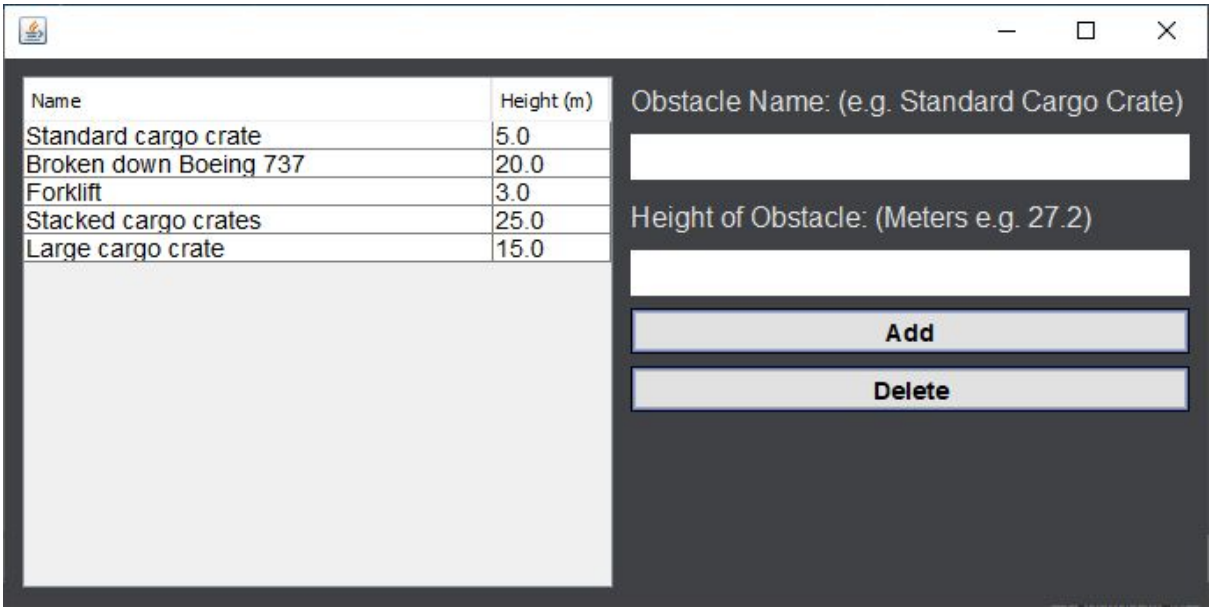

Figure 7

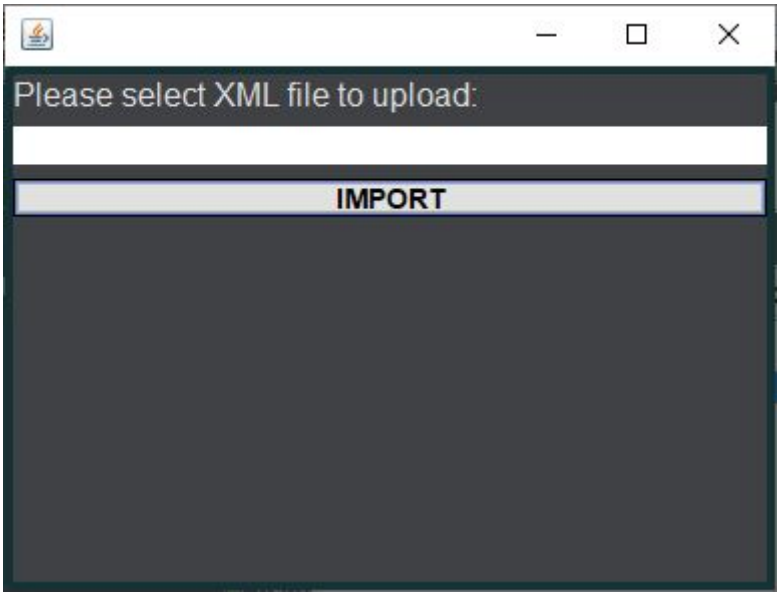

Figure 8

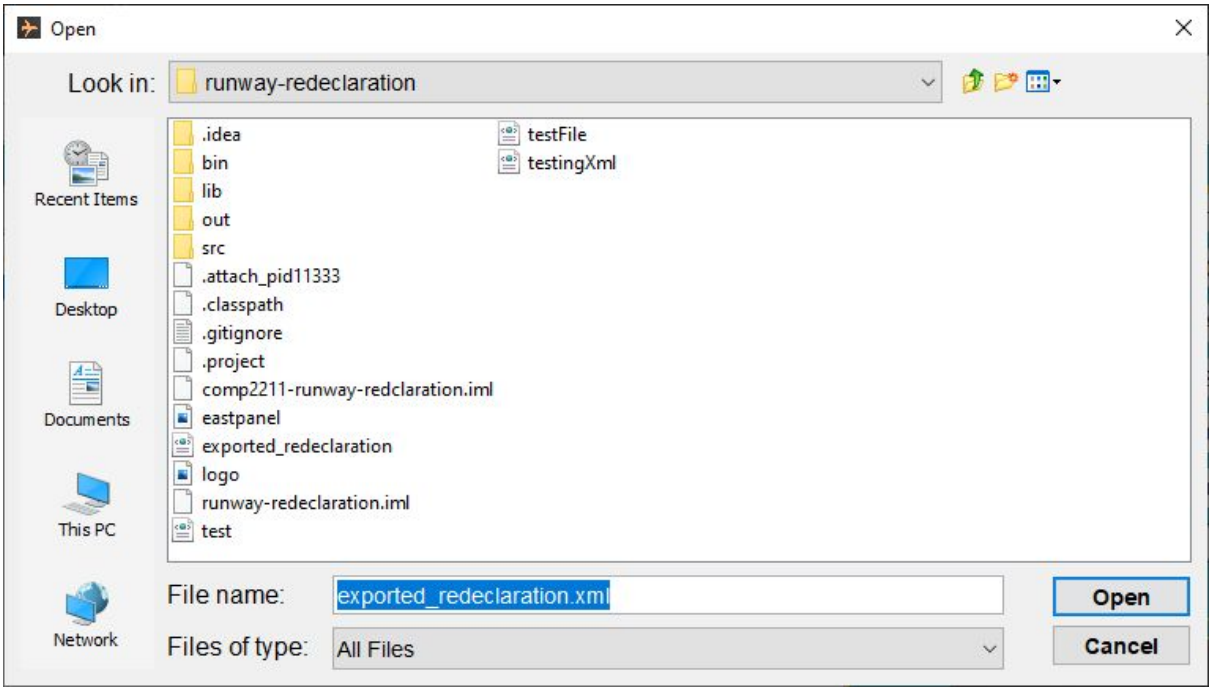

Figure 9

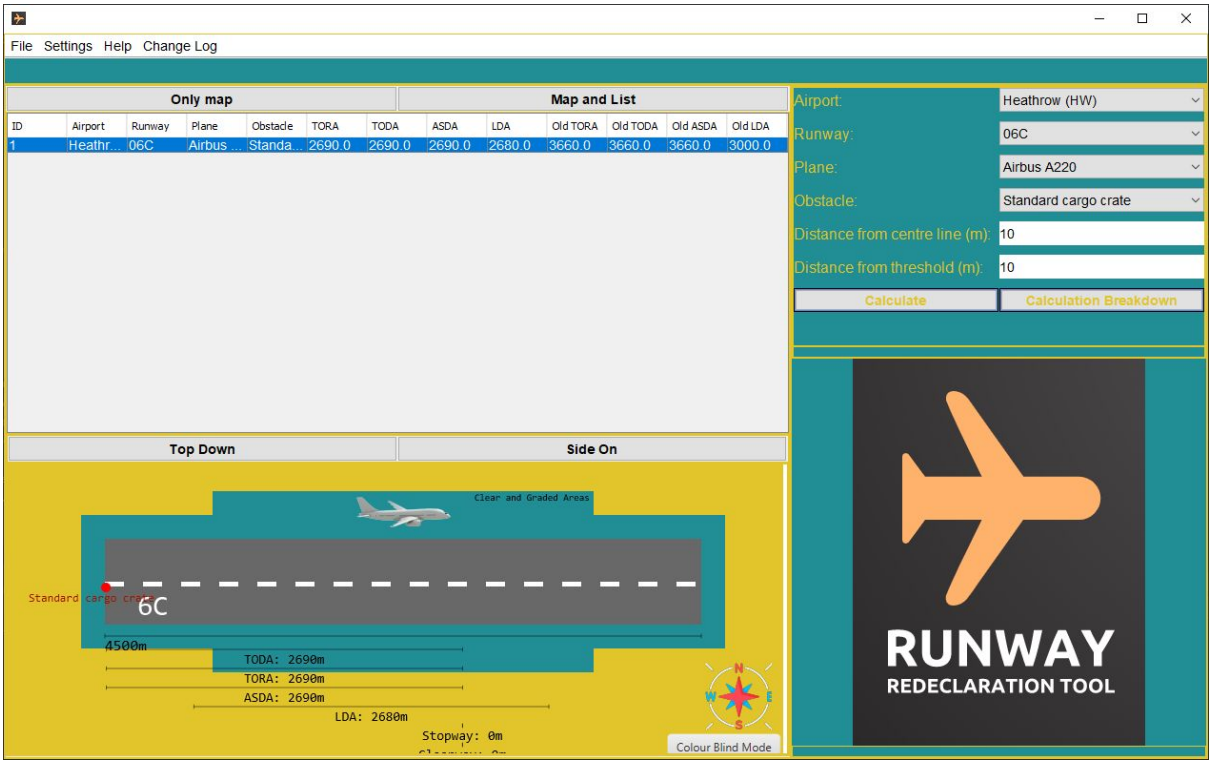

Figure 10

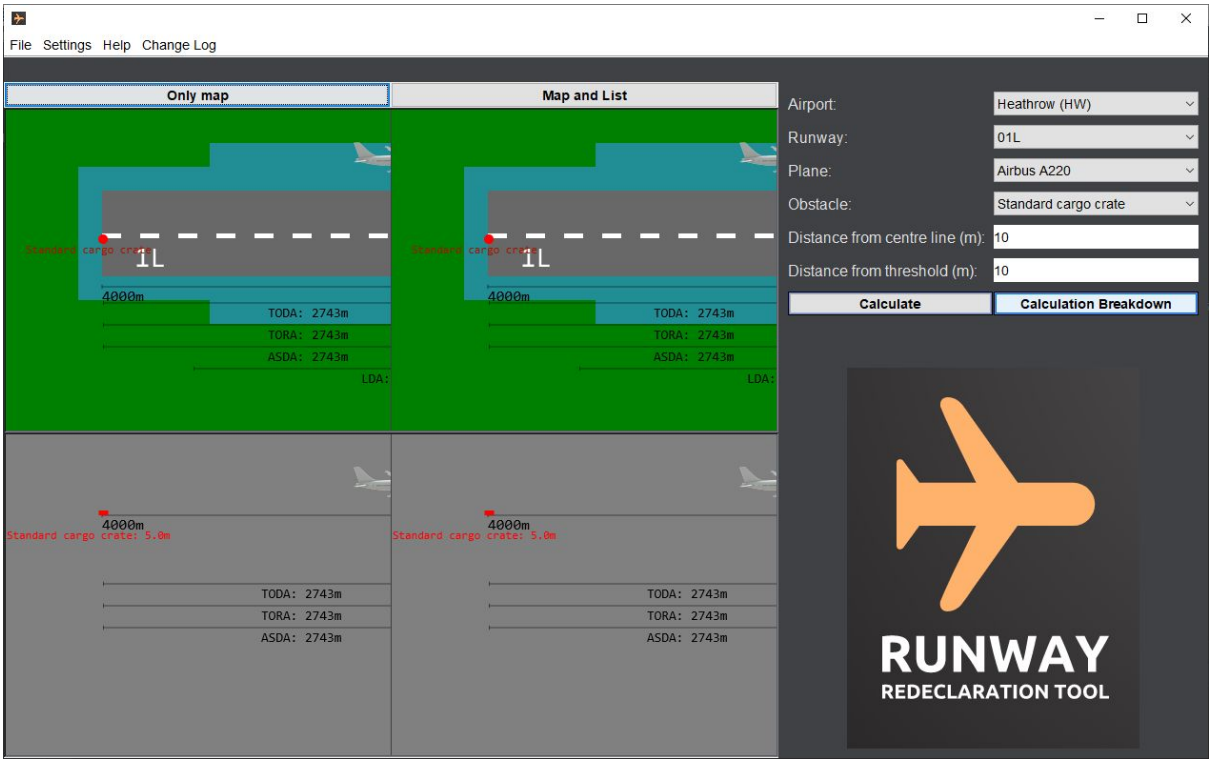

Figure 11

FAQs

- System Requirements:
  - Java 11 +
  - RAM: 128 MB
  - Disk space: 512MB
  - Processor: Minimum Pentium 2 266 MHz processor
  - OS: Windows Vista or later, OSX 10.8.3+, 64-bit Linux
  - Monitor w/ 1024 x 768 resolution or greater
  - Requirements based on Java 11 requirements
- What is the meaning of distance of left and right threshold?
  - These distances refer to the visualisation. For Example, if the runway is selected 27L/9R the distance from L threshold refers to the distance of the obstacle from the 9R threshold.
  - Left threshold is shown on the left side as it is the lower of the two thresholds.
- Are all the measurements in meters?
  - Yes. Until told otherwise, all the calculations are in meters.