Requirements to run registration GUI:

Python2.7 (https://www.python.org/download/releases/2.7/)
PyQt4
VTK5

First install python2.7. To install PyQt4 and VTK5, it is suggested to install anaconda https://www.continuum.io/downloads. Once installed, run conda install pyqt=4 and conda install vtk=5 in Anaconda Prompt to install PyQt4 and VTK5.

Note: if you have a different version of PyQt or VTK, the registration GUI might throw errors.

How to run registration GUI:
1. Open command prompt (Windows) or terminal (MacOS or Linux)
2. Change the current directory into the src folder
3. Type python main.py and hit enter
4. Once the GUI is launched, click "Import Moving Data" to import the moving dataset in .txt form (example file stored in "data" folder) , click "Import Fixed Data" to import the fixed dataset in .txt form.

Format of the dataset:
• Stored in .txt file
• Each (x, y, z) point is represented by a line in the file, separated by space (please see the example file for reference)

5. As you load data, you will see visualization. Click register when both datasets are loaded to see the result.
6. The registration result will be printed in the terminal you used to call main.py.

An example:
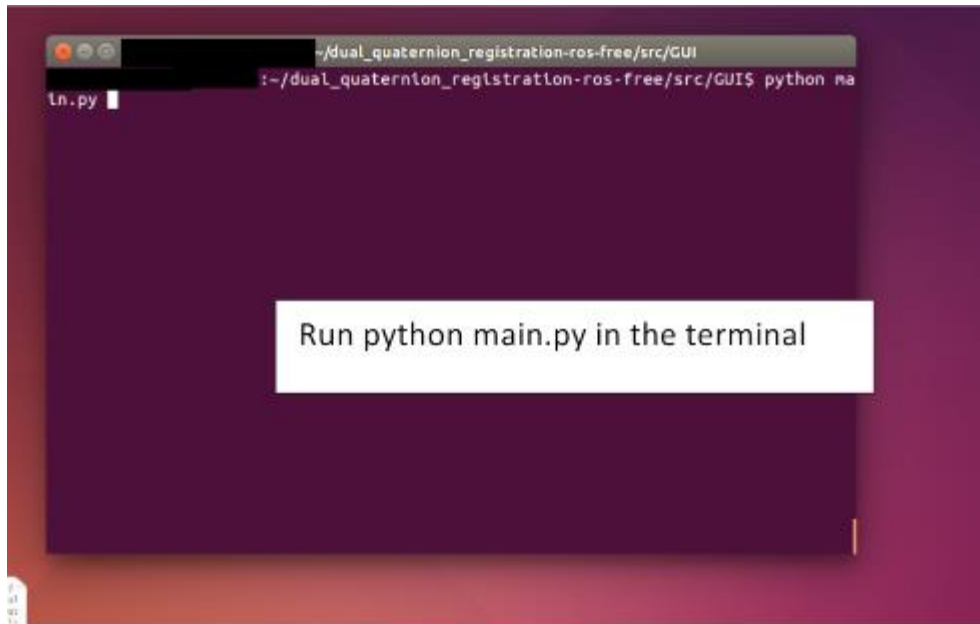
Run python main.py in the terminal

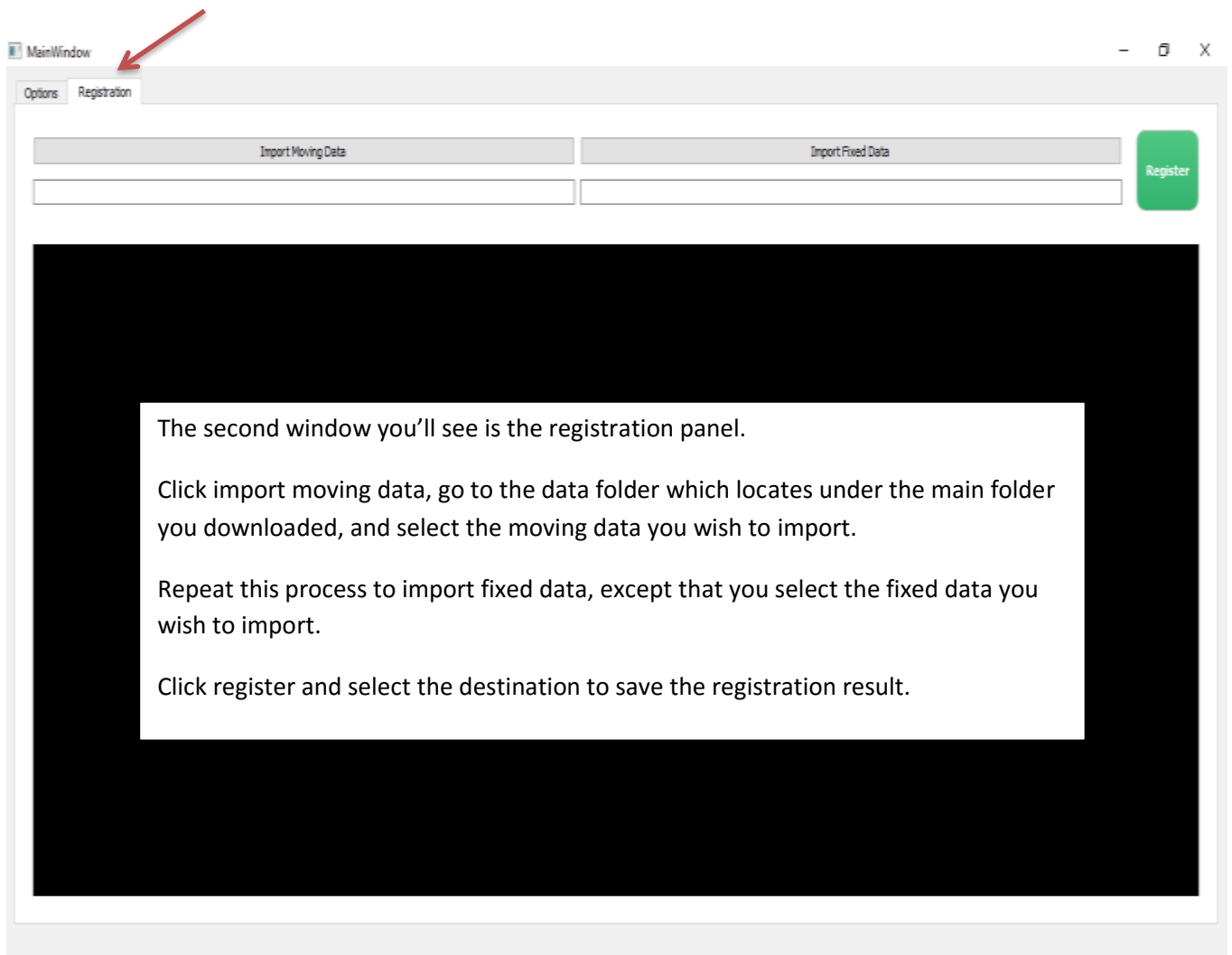The first window you'll see is the options panel.

Select Dual Quaternion Filtering Registration or Bingham Registration
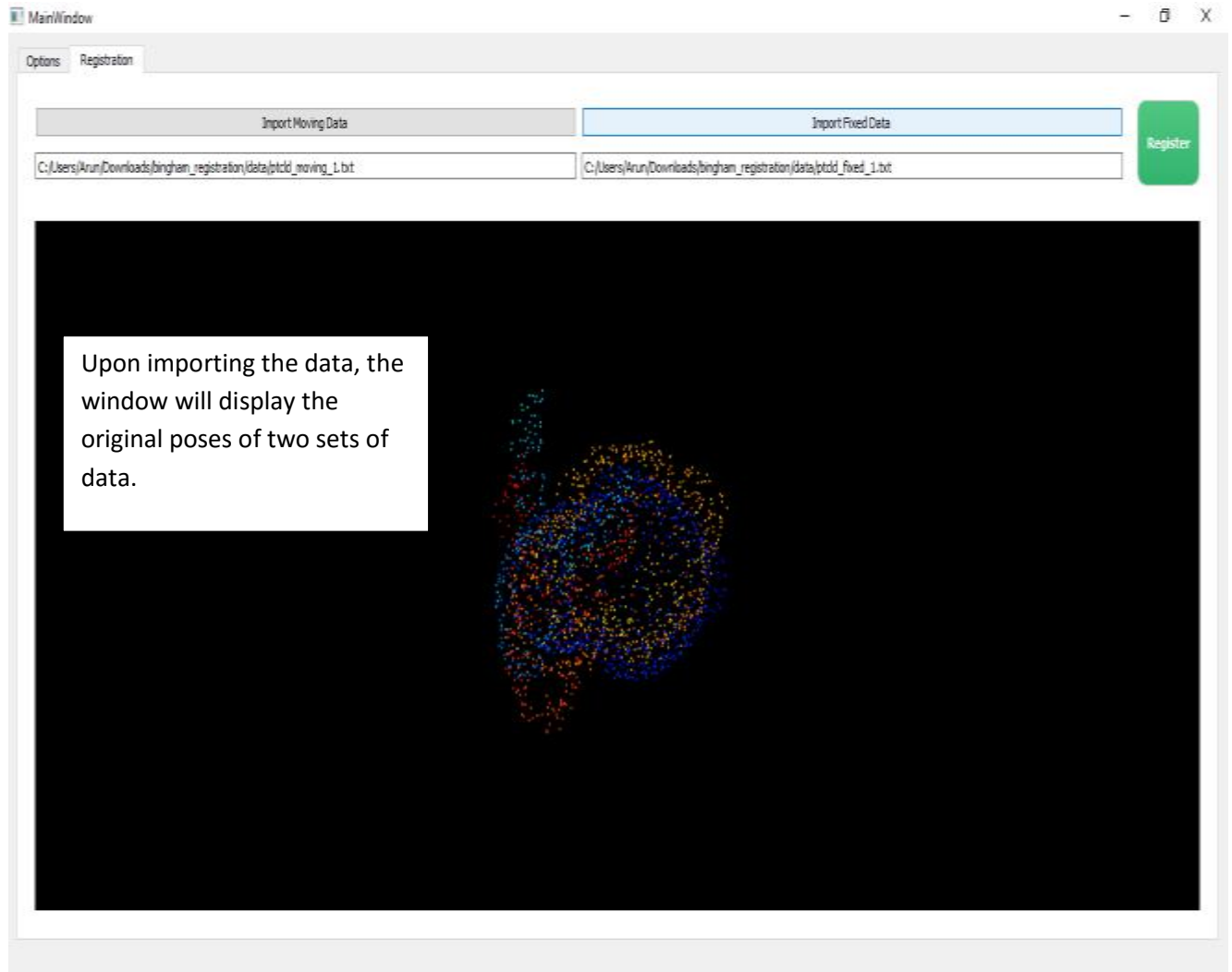
Set Max Iterations (Positive integer). This determines the maximum number of iterations that the registration will run.
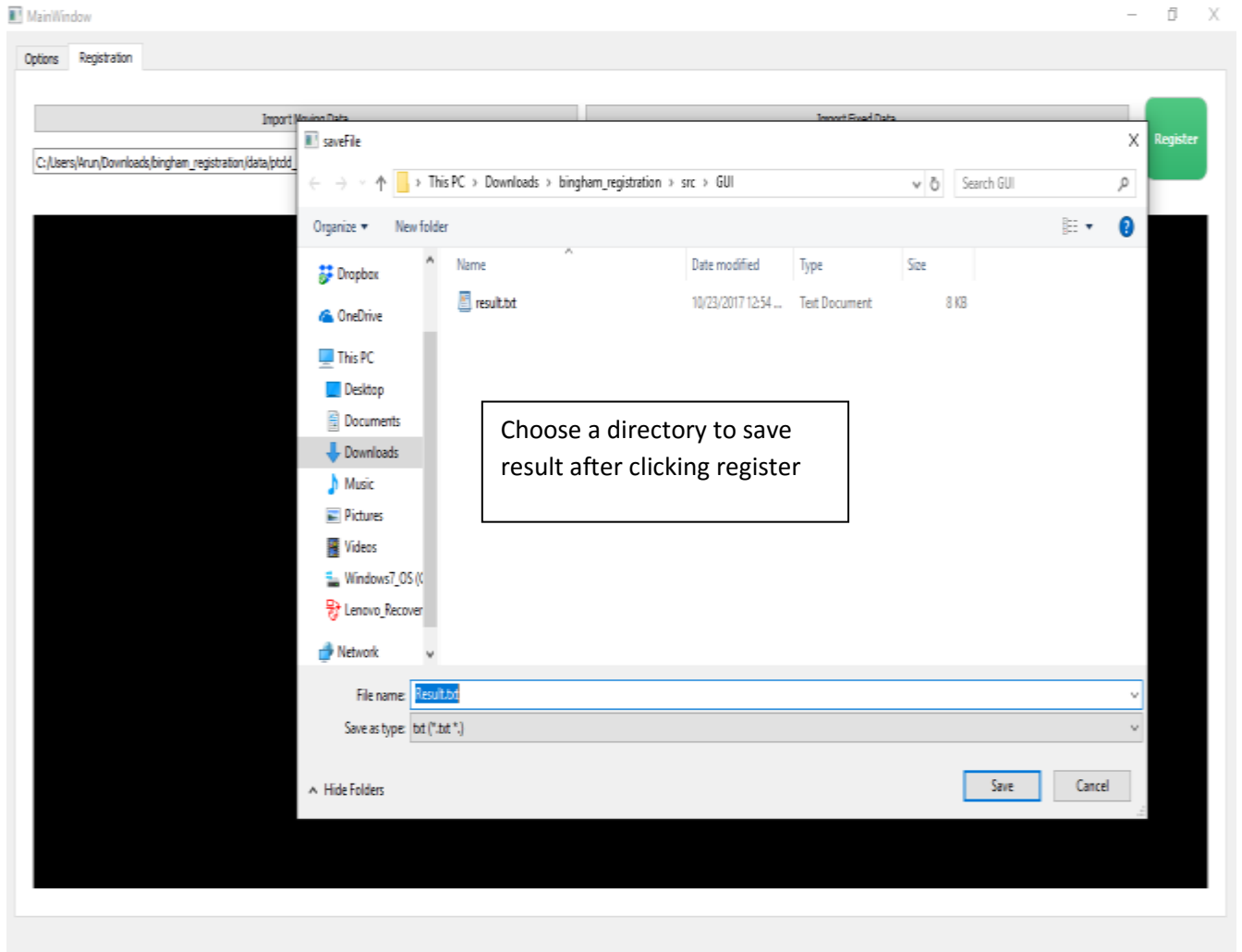
Set Inlier Ratio (0-1). This determines the ratio of good data in your model.

Set Window Size (Positive integer). This determines the batch size at each iteration.

Set Rotation Tolerance and Translation Tolerance (Positive). They determine the convergence criteria.

MainWindow

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Options Registration

| Import Moving Data | Import Fixed Data | Register |

The second window you'll see is the registration panel.

Click import moving data, go to the data folder which locates under the main folder you downloaded, and select the moving data you wish to import.

Repeat this process to import fixed data, except that you select the fixed data you wish to import.

Click register and select the destination to save the registration result.

Options   Registration

| Import Moving Data | Import Fixed Data | Register |

C:/Users/Arun/Downloads/bingham_registration/data/ptcld_moving_1.txt

C:/Users/Arun/Downloads/bingham_registration/data/ptcld_fixed_1.txt

Upon importing the data, the window will display the original poses of two sets of data.

Choose a directory to save result after clicking register

After the registration completes:

Left: the GUI window displays the registration result

Right: the exported result file

Xreg is the estimated registration parameters

The first three numbers show the translation while the next three are rotations in Euler angles (radians)

Xregsave is the list of estimated registration parameters over all iterations