Quick start guide for using direct-SIM software

Direct-SIM was implemented as a friendly Graphical User Interface (GUI) of MATLAB. The version provided here was developed on MATLAB R2014a version.

To facilitate the users to further analyze the reconstructed images, the calculation results of MATLAB are displayed in the graphics window of ImageJ through the open source plug-in **mij.jar** and **ij.jar**. A detailed discussion about the data exchange between MATLAB and ImageJ through mij.jar can be found from the following website:

http://bigwww.epfl.ch/sage/soft/mij/

Reference

Daniel Sage, Dimiter Prodanov, Jean-Yves Tinevez and Johannes Schindelin, "MIJ: Making Interoperability Between ImageJ and Matlab Possible", ImageJ User & Developer Conference, 24-26 October 2012, Luxembourg.
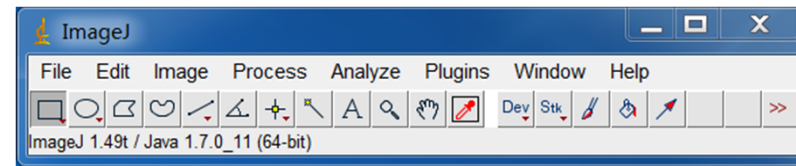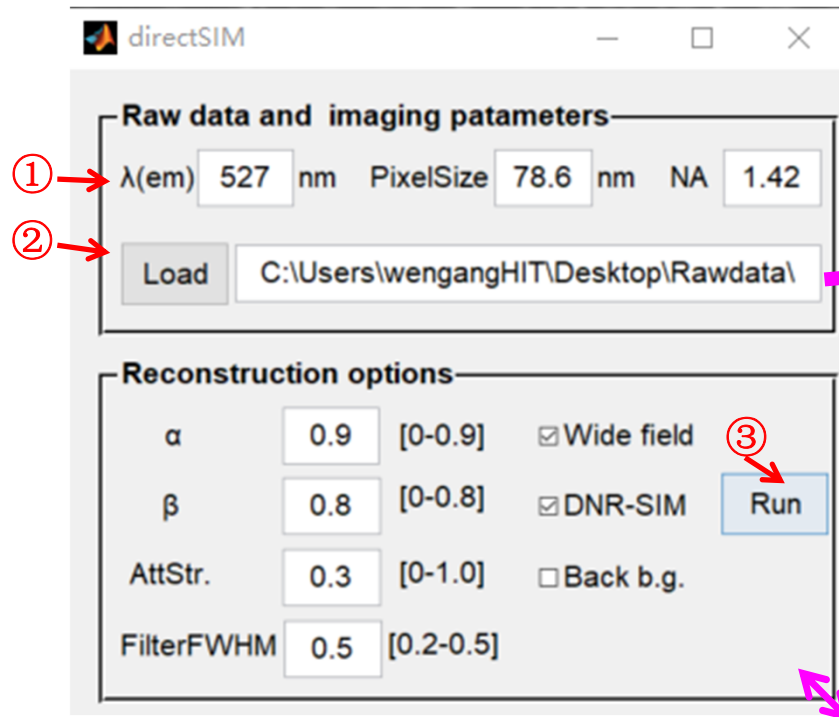
Step 1: Install mij.jar and ij.jar in MATLAB and set up the path:

➢ Copy MIJ(interfacing imagej and matlab)\mij.jar into the java directory of MATLAB (e.g for Window Machine 'C:\Program Files (x86)\MATLAB2014\java\').

➢ Copy MIJ(interfacing imagej and matlab)\ij.jar into the java directory of MATLAB.

➢ Open **Main.m** and expand the java classpath to mij.jar and ij.jar:

```
17 —  javaaddpath 'C:\Program Files (x86)\MATLAB2014\java\mij.jar'    % Note to replace the installation path
18 —  javaaddpath 'C:\Program Files (x86)\MATLAB2014\java\ij.jar'     % Note to replace the installation path
19 —  MIJ.start;
20
21 —  %%
22 —  directSIM;        % The results are displayed in ImageJ's graphics window
```

Step 2: Run the 'Main.m':

Step 3: Set the imaging parameters and load the raw SIM data:

directSIM

Raw data and imaging patameters

① λ(em) 527 nm PixelSize 78.6 nm NA 1.42

② Load C:\Users\wengangHIT\Desktop\Rawdata\

Reconstruction options

α 0.9 [0-0.9] ☑ Wide field

β 0.8 [0-0.8] ☑ DNR-SIM ③ Run

AttStr. 0.3 [0-1.0] ☐ Back b.g.

FilterFWHM 0.5 [0.2-0.5]

ImageJ

File Edit Image Process Analyze Plugins Window Help

ImageJ 1.49t / Java 1.7.0_11 (64-bit)

Order rules of raw data stack:

For 2D-SIM (3 angles, 3 phases):

angle 1: phase 1, phase 2, phase 3
angle 2: phase 1, phase 2, phase 3
angle 3: phase 1, phase 2, phase 3

Resize the window to better fit the screen!

Wide field
1024x1024 pixels; 32-bit; 4MB

direct-SIM
1024x1024 pixels; 32-bit; 4MB