

This repository contains Matlab scripts which implement the key components of the workflows described in:

J.A. Pike et al. Quantifying Receptor Trafficking and Colocalization with Confocal Microscopy. Methods (2017), <http://dx.doi.org/10.1016/j.ymeth.2017.01.005>.

Please cite this article if you use any of the scripts in this toolbox.

exampleWorkflow.m will run the entire workflow on the example dataset (exampleTimelapseAcquisition.nd2) and also produce graphical figures and visualisations of the results.

To run the scripts you will need the following.

- A licenced Matlab installation. The toolbox was created with Matlab 2014a (8.3.0.532).
- A working installation of ImageJ (<https://imagej.nih.gov/ij/>) with the PureDenoise plugin installed (<http://bigwww.epfl.ch/algorithms/denoise/>) [1].
- mij.jar is required for the interface between Matlab and ImageJ (<http://bigwww.epfl.ch/sage/soft/mij/>) [2].
- The Bioformats Matlab toolbox to read the raw data (<http://downloads.openmicroscopy.org/bio-formats/5.2.4/>).
- The following two MathWorks File Exchange submissions:
 - <https://uk.mathworks.com/matlabcentral/fileexchange/15455-3d-euclidean-distance-transform-for-variable-data-aspect-ratio> [3]
 - <http://uk.mathworks.com/matlabcentral/fileexchange/22940-vol3d-v2>

[1] F. Luisier, C. Vonesch, T. Blu, M. Unser, Fast interscale wavelet denoising of Poisson-corrupted images, Signal Processing. 90 (2010) 415–427.

[2] D. Sage, D. Prodanov, J.-Y. Tinevez, J. Schindelin, MIJ: making interoperability between ImageJ and Matlab possible, in: ImageJ User & Developer Conference, 2012: pp. 24–26.

[3] Y. Mishchenko, A fast algorithm for computation of discrete Euclidean distance transform in three or more dimensions on vector processing architectures, Signal, Image and Video Processing. 9 (2015) 19–27.