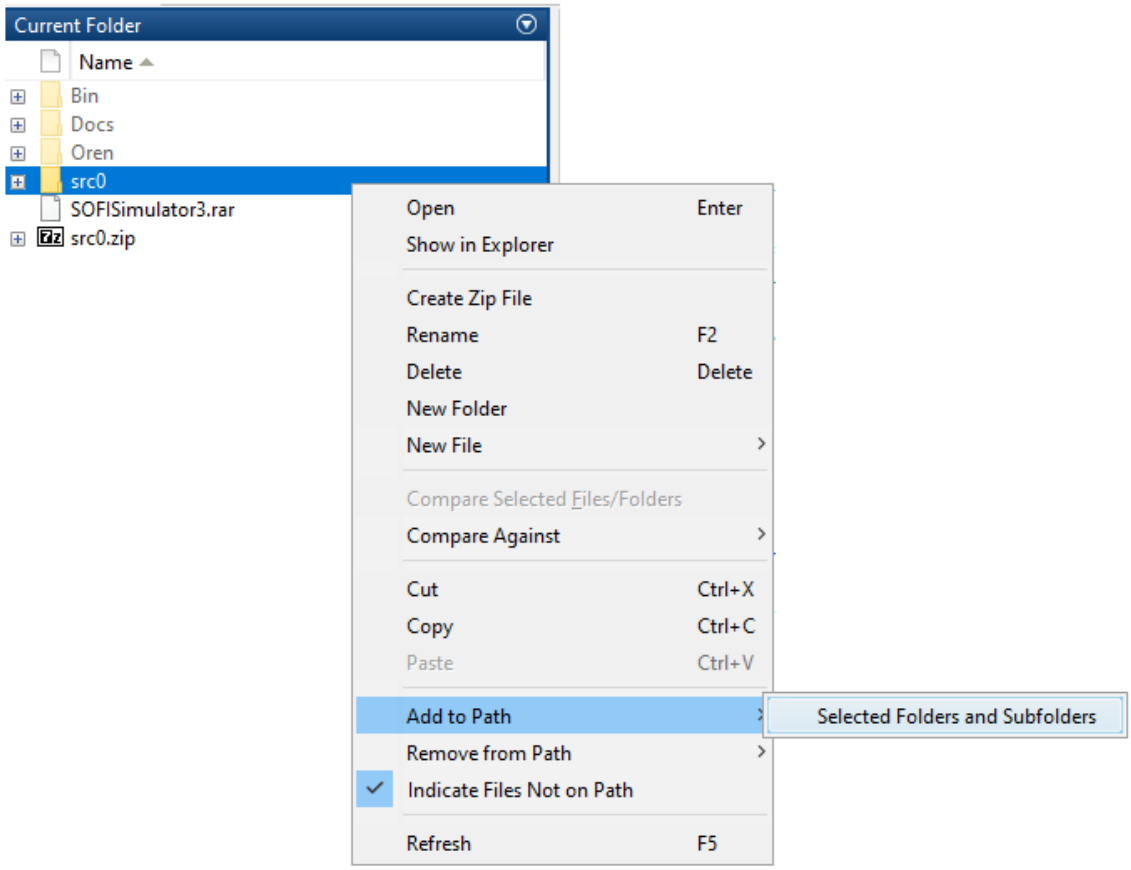
COEDES Hands on

Intro

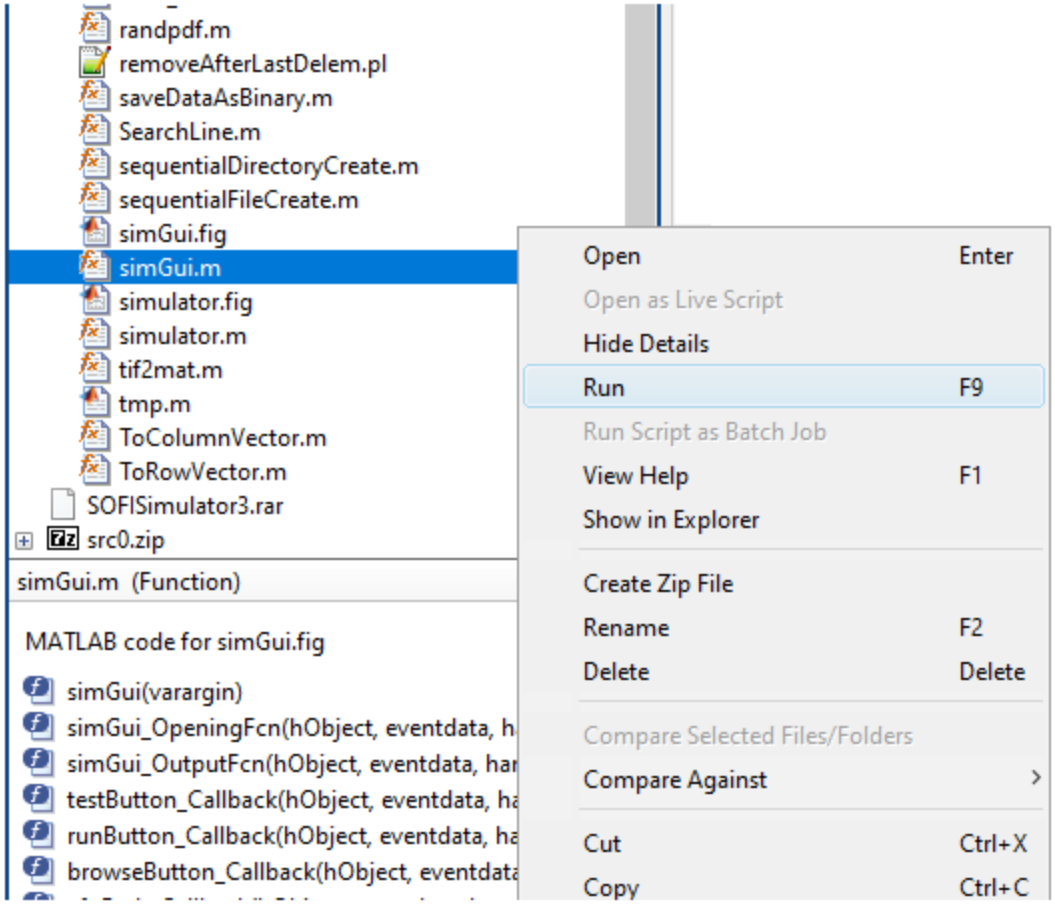
This document contains a simple hand on instructions that will help the user in using COEDES Matlab interface.

COEDES step by step

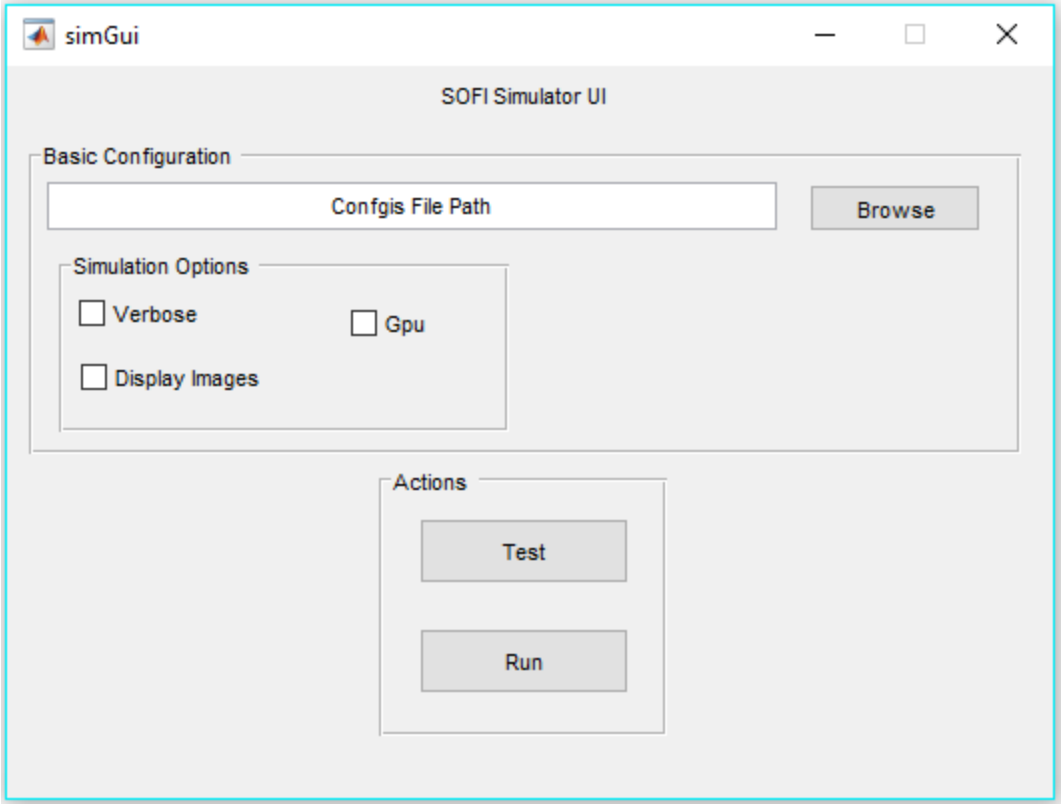
1. Copy the COEDES source code to your area.
2. Add the folder src0 folder and its subfolder to the Matlab path.



3. Right click on the simGui.m file under src0 folder then click Run.



4. In the open window click browse to choose the configuration file you wish to run the simulator with.



5. Check/Uncheck the desired options under the Simulation Options section in the Gui above.
6. Click test to display a randomly generated image based on the supplied configurations.
7. Click run to start the simulation.

Configurations file hands-on

The simulator configurations file is a simple .txt file that contains a set of assignments to parameters that are recognized by the simulator.

Each line of assignments should end by a ";", any data in the line that found after the ";" would be considered as comments.

A line comment can be started with %.

Please refer to table 3.1 in the project report for a full description of the configuration file.

Variable Name	Description
frames_number	The number of frames of the generated movie.

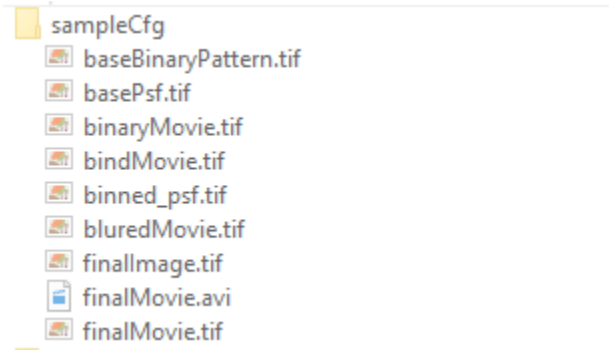
FOV	The FOV size in [nm] – we only use squared FOV.
output_directory	A full path string to the directory that the simulator output would be saved to.
log_file_name	The log file name, log files are located under Bin/Logs, if a log with this name already exist the log file would contain sequential number.
patern_file_path	A full path string to the file that contains the pattern data from which the movie will be generated from.
sample_size	The “Ground Truth” the object size in pixels.
quantom_dots_number	The number of quantum dots in the sample – this option can be replaced by defining the FOV and density of emitters' variables.
density	The density of quantum dots in [nm^2]
psf_file	A full path string to the file that contains the PSF image.
uncertinity	The uncertainty of the distribution function in terms if [nm].
tau_on	The life expectancy of the on-state of illuminating cell in [sec].
tau_off	The life expectancy of the off-state of illuminating cell in [sec].
cam_bin_level	The binning level of the camera simulator.
cam_noise_mean	The mean value of the Gaussian noise of the camera model.
cam_noise_var	The variance if the Gaussian model of the camera.
out_format	The output files format – string from {mat, txt, tif} that the output files would be saved in.
DC_level	The dc level of the simulation should be normalized to [0 1] interval.
out_of_focus_layers	The number of out of focus layers in the simulation.

Configurations file example

sampleCfg.txt :

```
log_file_name = sampleCfg;
patern_file_path = C:\ COEDES\Bin\Cellular_structures\MicroT_test.mat;
patern_file_path_sec = C:\ COEDES\Bin\Cellular_structures\MicroT_test4.mat;
sample_size = [512, 512];
frames_number = 10;
quantom_dots_number = 1000;
density = 20;
FOV = 5120;
output_directory = C:\ COEDES\Bin\Outputs\MicroT_test;
psf_file = C:\ COEDES\Bin\PSFGenerator\latest_psf.mat;
uncertinity = 100;
tau_on = 1.4;
tau_off = 1.4;
cam_noise_mean = 0.01;
cam_noise_var = 0.0001;
cam_bin_level = 4;
mode = data;
out_format = tif;
DC_level = 0.01;
out_of_focus_layers = 4;
```

running the simulator with those configurations will yield the following files:



Helper scripts

The file BatchProcess.m demonstrates how to use COEDES without the given UI, as it runs the simulator routinely with a change of a given parameter's value in each iteration.

Please refer to the code in the file BatchProcess.m for extra info.