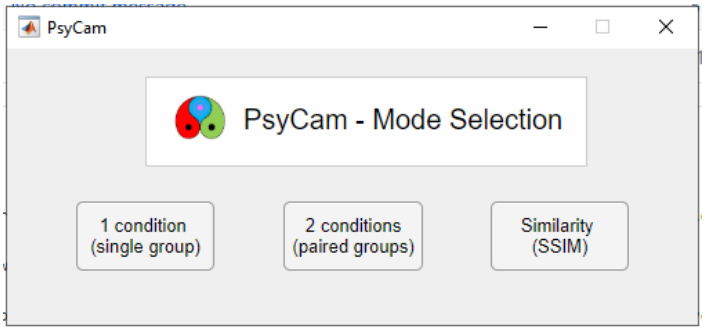
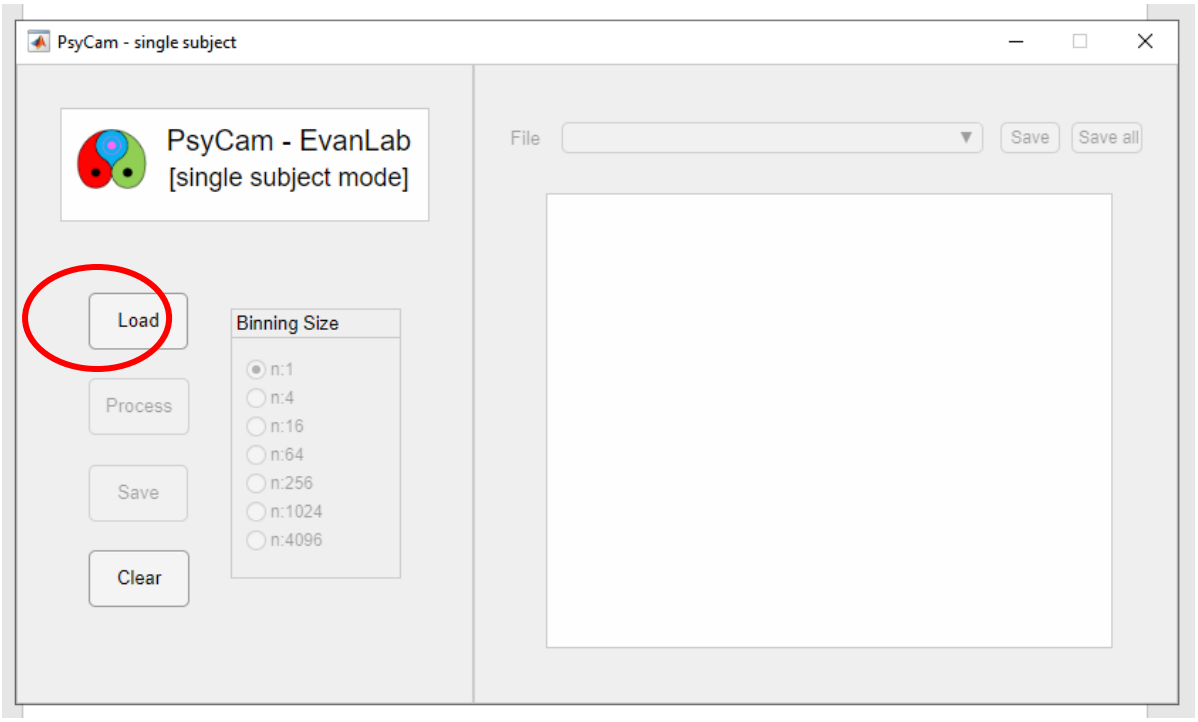
Once run, PsyCam asks you to select the “Mode”:

1. “1 condition” allows to load 1 set of *.DNG files, compute the binning and extract some metrics at “single image” level;
2. “2 conditions” allows to load 2 sets of *.DNG files, compute the binning and extract some metrics at “paried images” level;
3. “Similarity” allows to load 1 set of *.mat files (previously processed using “1 condition” mode and extract the similarity metric between the files and the targets.



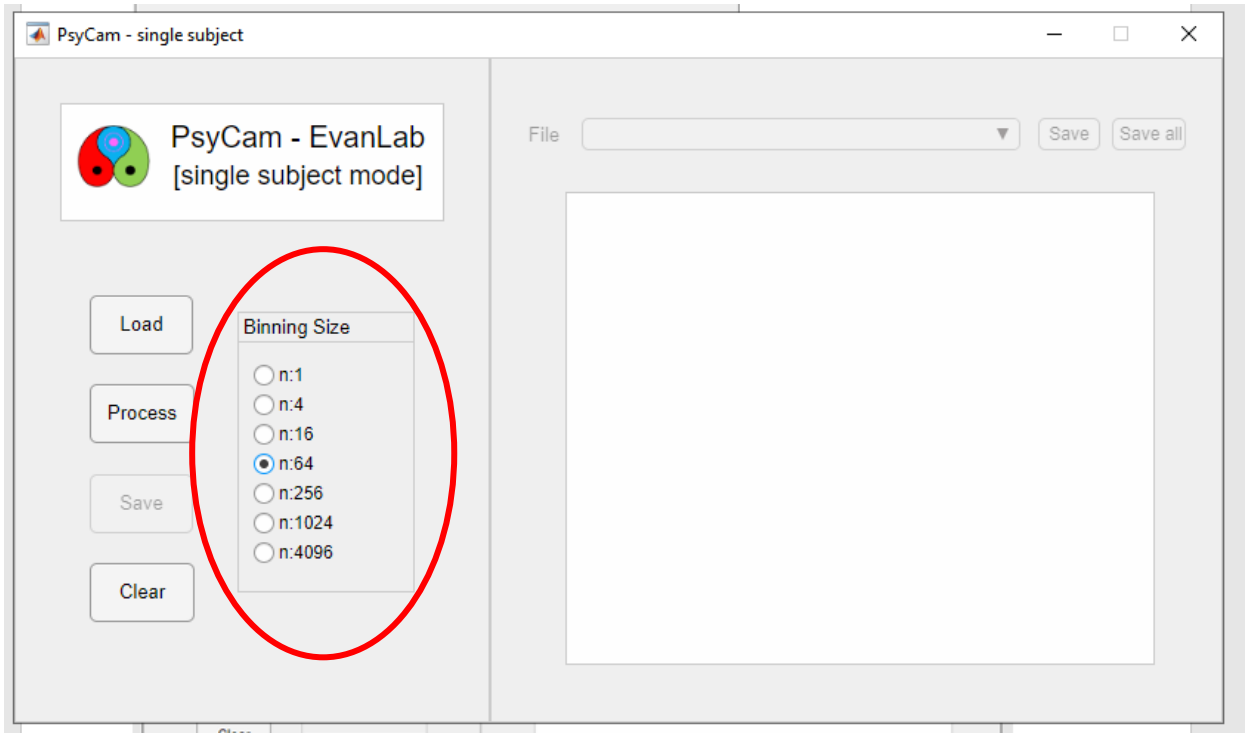
“1 condition” mode

1. Load 1 set of *.DNG images using the “Load” button;



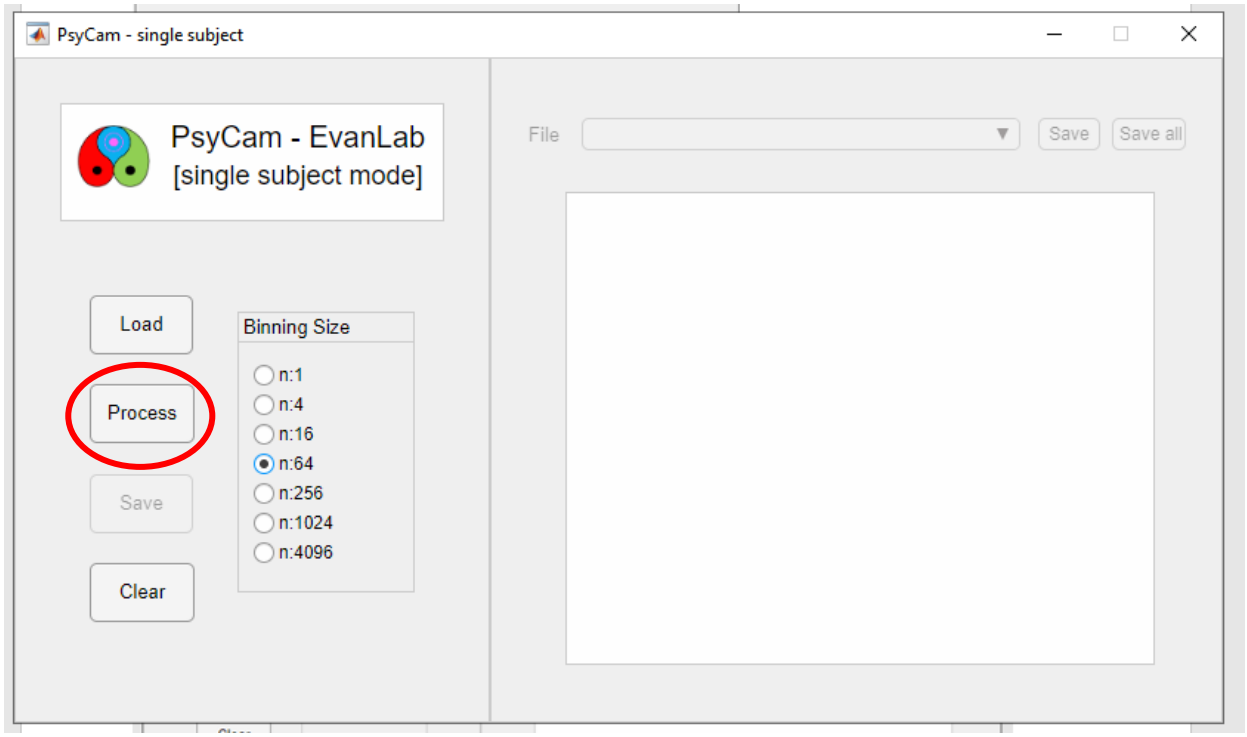
***

2. Select the binning size: 1 (1*1), 4 (2*2), 64 (8*8), 256 (16*16), 1024 (32*32) and 4096 (64*64).



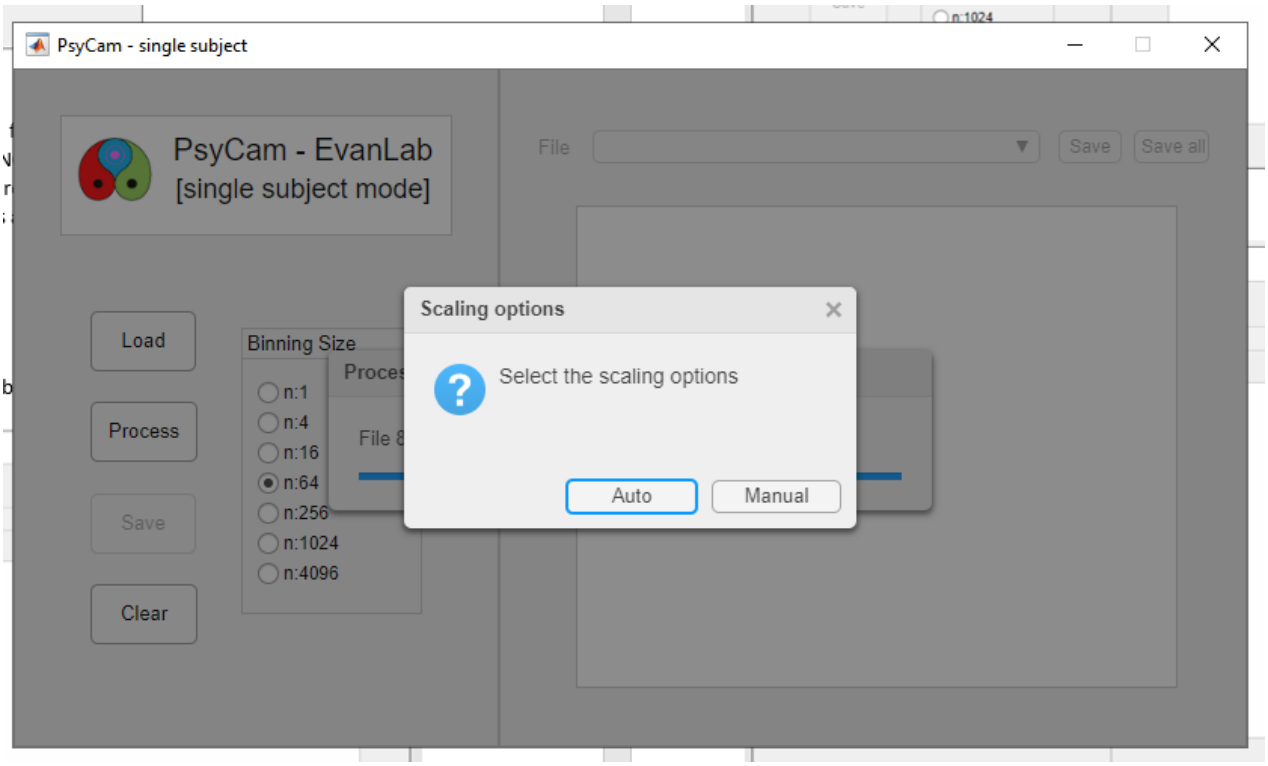
***

3. Process the data using the “Process” button;



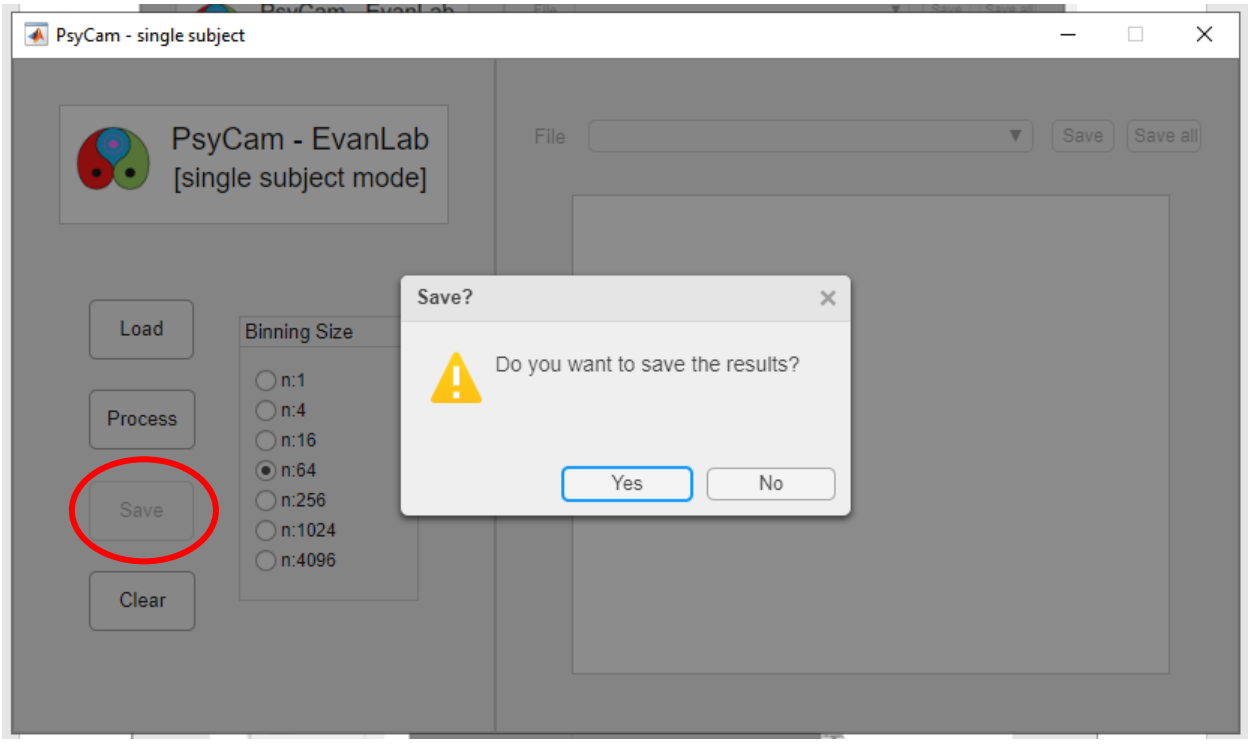
***

4. Select the “scaling options” for the visualization:
    a. Auto: the minimum and maximum values are, respectively, the minimum and maximum values within all the processed (binned) images.
    b. Manual: provide custom minimum and maximum values.



***

5. Choose to save the processed files. You can also save the files using the (left) “Save” button .



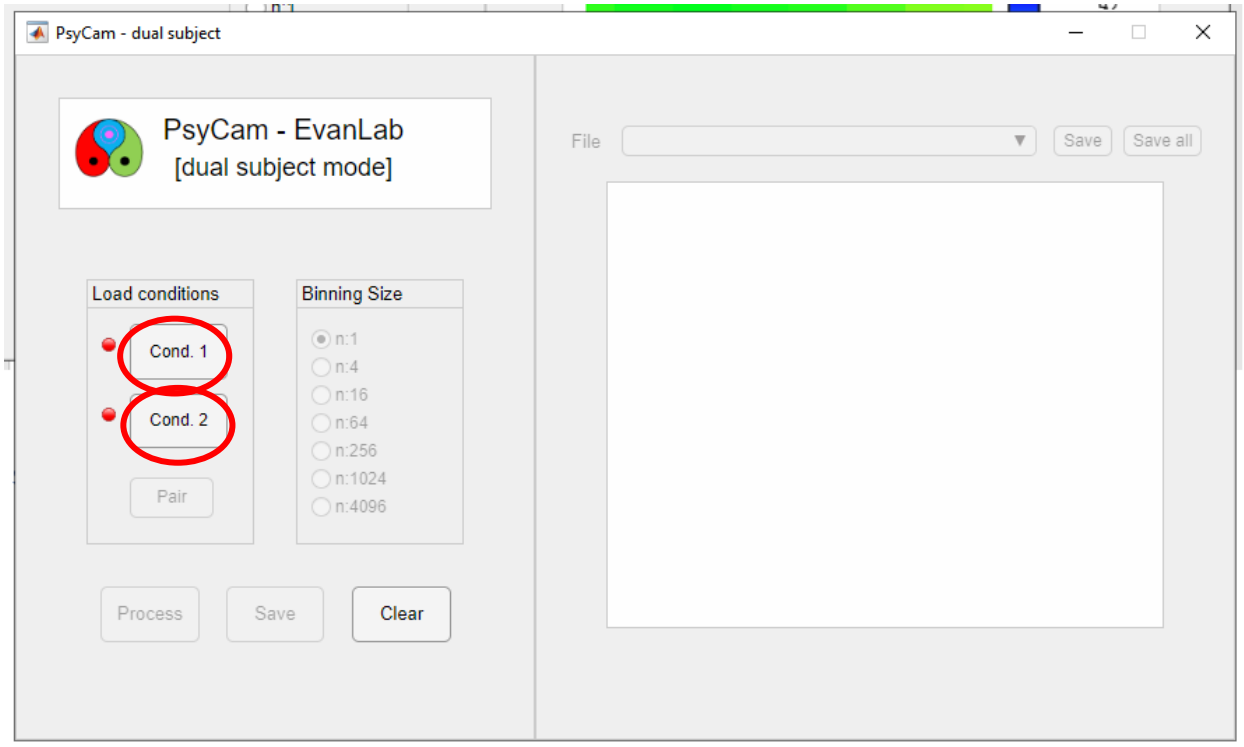
***

6. Select the image to be plotted using the dropdown menu, save the current image using the “Save” button, save all the images using the “Save all” button.


PsyCam - single subject
PsyCam - EvanLab
[single subject mode]
File
C:\Users\marco\Google Drive [IULM]\Matla...
Save
Save all
Load
Process
Save
Clear
Binning Size
n:1
n:4
n:16
n:64
n:256
n:1024
n:4096
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
Range: 0 - 65535

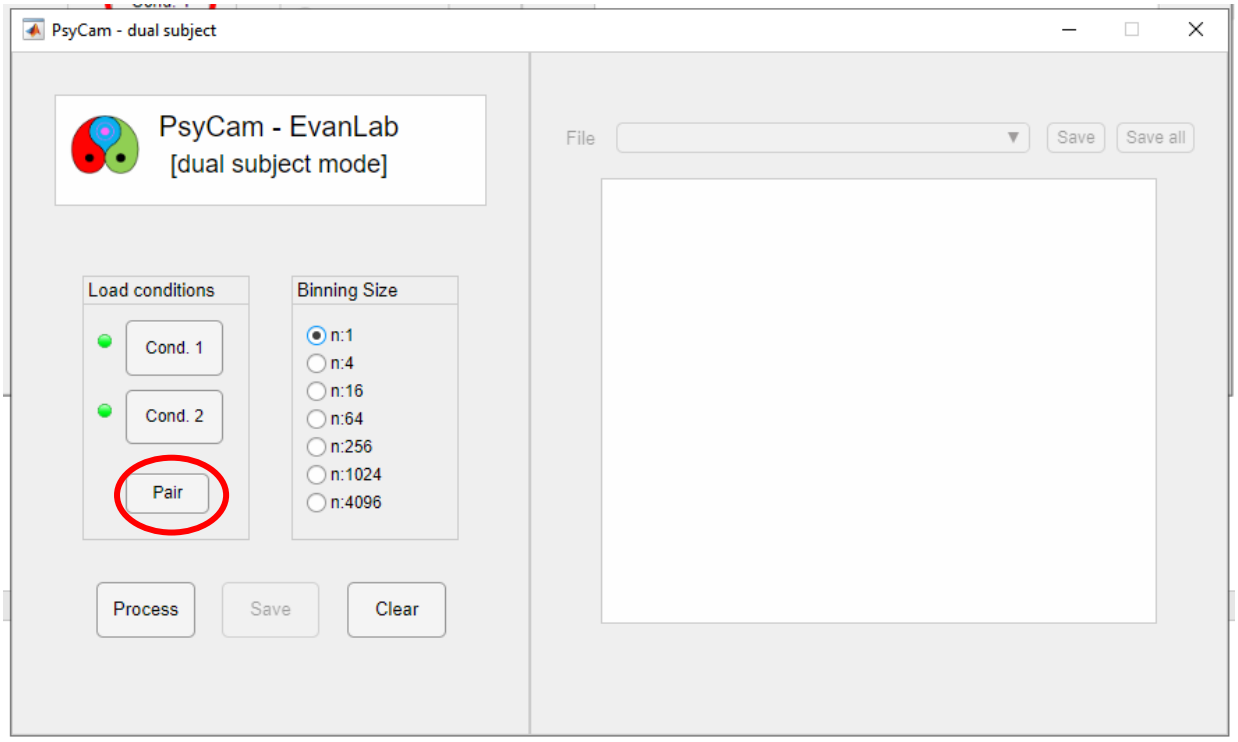
2 subject mode

1. Load 1 set of *.DNG files as condition 1 using “Cond.1” button and 1 set of *.DNG files as condition 2 using “Cond. 2” button. Please note that, since the files must be paired, the number of files loaded as condition 1 and 2 must be equal.



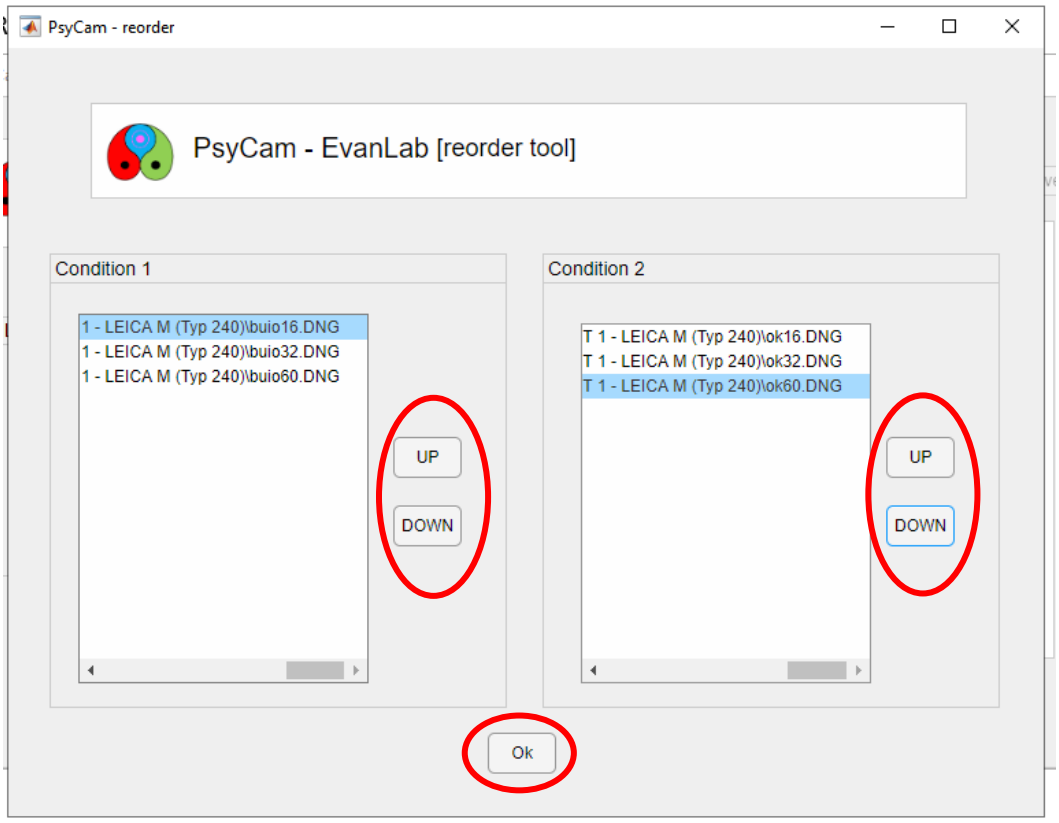
***

2. Re-organize the files using the “Pair” button.



***

3. Click on the file and move it up or down in order to match with the corresponding file on the right. In the following example, the matched pairs are “buio16” with “ok16”, “buio32” with “ok32” and “buio60” with “ok60”. Press ok to confirm.

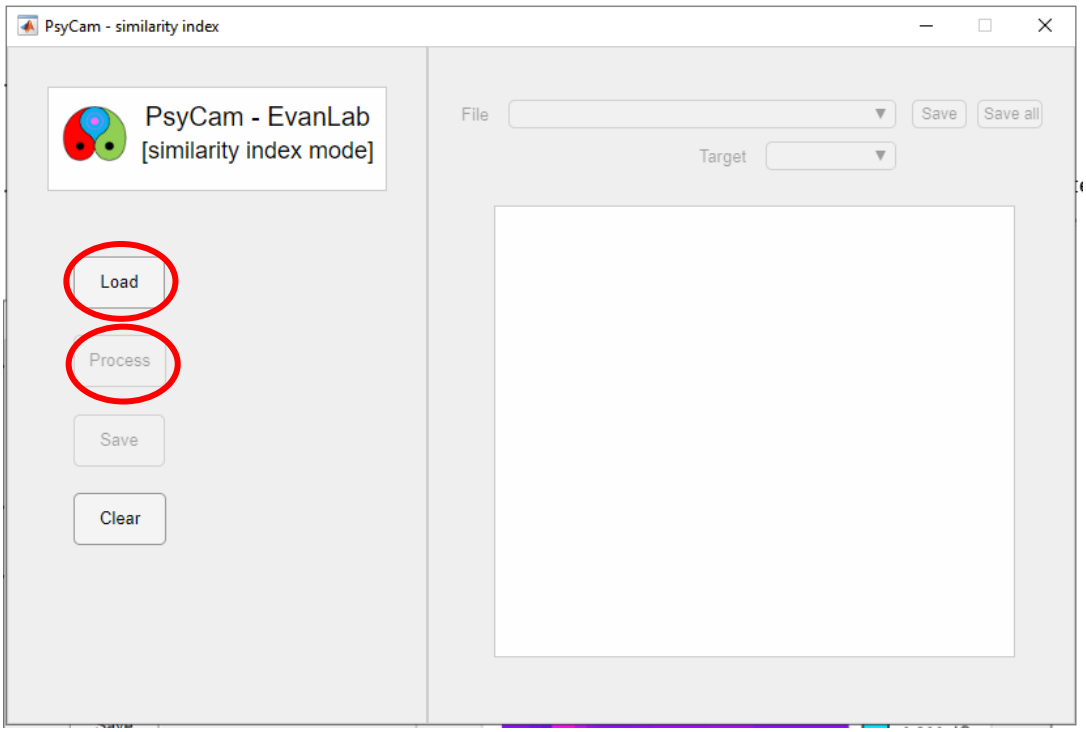


***

4. Select the binning size, process the data, select the scaling option and choose to save the results - as in “1 condition” mode.
5. Select the image to be plotted using the dropdown menu, save the current image using the “Save” button, save all the images using the “Save all” button – as in “1 condition” mode.

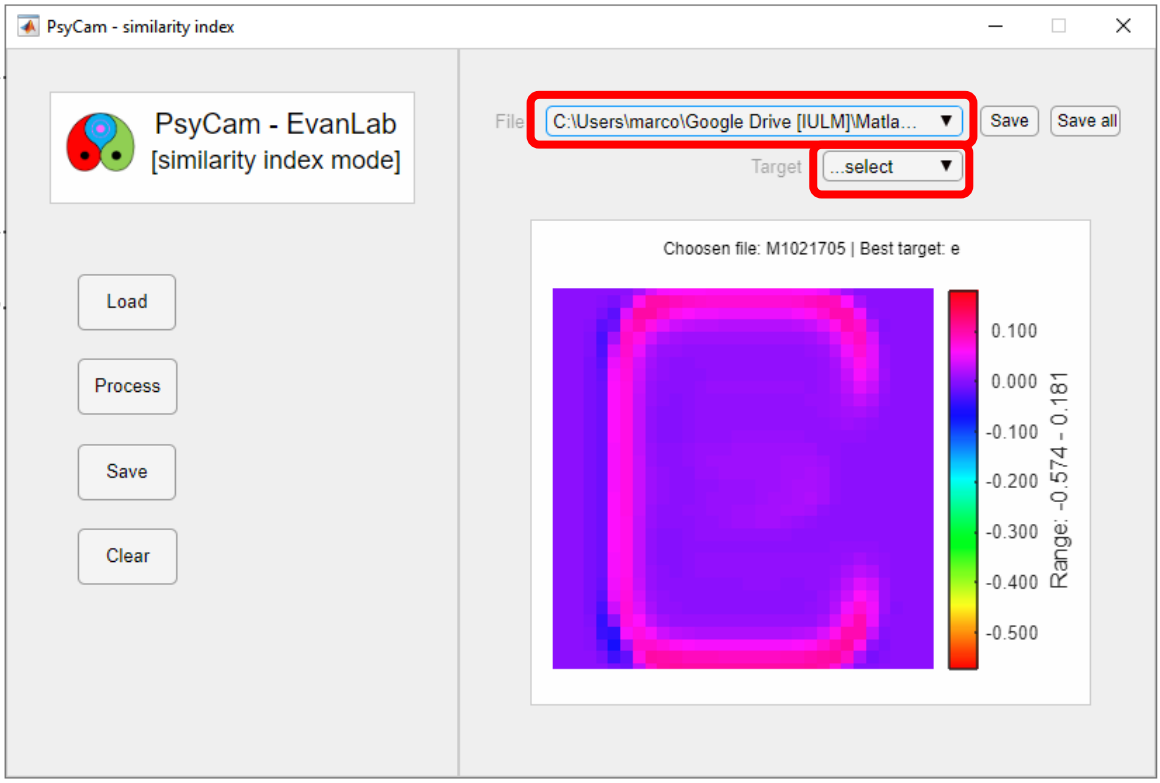
Similarty mode

1. Load a set of *.mat files as saved with “1 condition mode” using the “Load” button and process them using the “Process” button.



***

2. Select the scaling option and choose to save the results - as in “1 condition” and “2 condition” modes.
3. Use the “File” dropdown menu to select the file: the best target (within all targets) for the selected file will be automatically displayed. Use to “Target” dropdown menu to select the target: the file with the highest similarity (within all files) will be automatically displayed. Save the current image using the “Save” button, save all the images using the “Save all” button – as in “1 condition” and “2 condition” modes.


PsyCam - similarity index
PsyCam - EvanLab
[similarity index mode]
Load
Process
Save
Clear
File
C:\Users\marco\Google Drive [IULM]\Matla...
Save
Save all
Target
...select
Choosen file: M1021705 | Best target: e
0.100
0.000
-0.100
-0.200
-0.300
-0.400
-0.500
Range: -0.574 - 0.181

Saved files

In all the modes, the (right) “Save” and “Save all” buttons save, respectively, the selected and all the output images in both *.png and *.mat (containing a numerical matrix).

The (left) “Save” button saves different output files, depending from the mode

In “1 condition” mode, the output file is a *.csv that contains, in addition to “Filename” and “BinSize” information, the sum of the pixel values (Sum), the maximum and minimum pixel values (Max, Min) as well as the mean and standard deviation (Mean, Std) of the pixel values.

	Filename	BinSize	Sum	Max	Min	Mean	Std
2	buio16	64	174.8447	2.843813	2.635203	2.731949	0.049613
3	buio32	64	244.2151	4.001642	3.611636	3.815861	0.094126
4	buio60	64	392.8754	6.710717	5.624559	6.138678	0.249543
5	ok16	64	195.704	3.14454	2.972872	3.057875	0.044026
6	ok32	64	279.4841	4.648995	4.044832	4.366939	0.14994
7	ok60	64	399.3808	6.82338	5.641275	6.240325	0.289957
8	old30	64	244.2975	4.013527	3.50838	3.817148	0.14228
9	old60	64	353.3747	5.885099	5.062896	5.521479	0.21433

***

In “2 condition” mode, the output file is a *.csv that contains, in addition to paired “Filename” and “BinSize” information, the Mean Absolute Error (MAE), the Mean Difference Error (MDE) and the Mean Squares Difference Error (MSDE) of the difference between the paired images.

	Filename	BinSize	MAE	MDE	MSDE
2	buio16_VS_ok16	64	20.85925401	-20.85925401	-120.7384449
3	buio32_VS_ok32	64	35.26901872	-35.26901872	-289.4575504
4	buio60_VS_ok60	64	7.137131016	-6.505414439	-81.9041632

***

In “Similarity” mode, the output files are 2 *.csv.

The “output” file contains, in addition to the “Filename”, the SSIM values for each target (cross, e, h, n4, n7, pi, square, triangle, u, x) as well as the best matching (Best_matching) target for each image.

	Filename	circle	cross	e	h	n4	n7	pi	square	triangle	u	x	Best_matching
2	buio16	-1.41E-05	-9.78E-07	-3.94E-05	6.03E-06	-4.28E-05	-3.95E-05	-8.24E-06	4.13E-06	-4.45E-05	-3.28E-06	-6.51E-05	h
3	buio32	7.12E-05	6.80E-08	-4.28E-05	2.55E-05	-5.47E-06	9.26E-06	3.90E-06	0.000202651	-3.70E-06	1.39E-05	-3.73E-06	square
4	buio60	0.000371732	8.04E-05	-0.000112842	0.000105049	8.68E-05	8.76E-05	0.000166234	0.00069429	0.000121453	0.000117387	0.00016425	square
5	ok16	-9.87E-06	-1.73E-05	-2.24E-05	1.28E-05	-3.51E-05	-2.61E-05	-5.88E-06	3.74E-06	-2.79E-05	1.60E-06	-4.60E-05	h
6	ok32	6.57E-05	2.18E-05	-6.89E-05	4.24E-05	-5.43E-06	-1.27E-05	1.04E-05	0.000213072	7.11E-06	1.77E-05	-2.60E-05	square
7	ok60	0.000871434	0.000366557	-1.42E-05	0.000185952	0.00034559	0.000364305	0.000316225	0.001600662	0.000351193	0.000241706	0.000565176	square
8	old30	0.00034357	5.58E-05	0.000105695	5.72E-05	0.000158219	0.000249553	8.08E-05	0.000680626	0.000168209	7.93E-05	0.000248275	square
9	old60	0.000694187	0.000198379	3.07E-05	0.00013104	0.000317713	0.000324871	0.00020203	0.001314422	0.000359916	0.000169564	0.00052156	square

The “target” file contains the best matching file (Best_matching_filename) for each target.

	Target	Best_matching_filename
2	circle	ok60
3	cross	ok60
4	e	old30
5	h	ok60
6	n4	ok60
7	n7	ok60
8	pi	ok60
9	square	ok60
10	triangle	old60
11	u	ok60
12	x	ok60