imagegui

File Data Pre Processing MVA Data Display

Data Selection Panel

Name of Image Matrix	Name of Variable Matrix	Scores	Loadings	Variance
imagedata_dan...	exactmass_dan01	PCA_s	PCA_l	PCA_v

This tutorial contains navigation buttons that enable you to move throughout the tutorial.

Please use the navigation buttons and not the page up/page down or arrow keys to navigate through the tutorials.

This is the 'Next' button. It takes you to the next frame or stop point.

This is the 'Previous' button. It takes you to the previous frame or stop point.

This is the 'Go to frame' button. It takes you to a specified frame.

This is the 'Go to URL' button. It takes you to a website link.

Press the 'Next' button below to start this tutorial.

imagegui

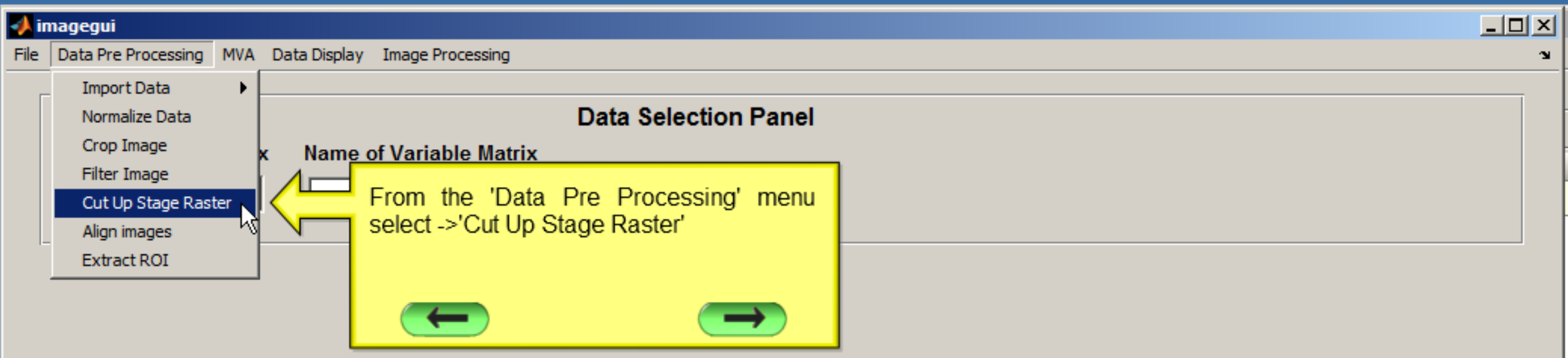
File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix imagedata_stich...

Name of Variable Matrix exactmass_stichsc...

This tutorial covers how to cut up a stage raster image into the individual tile images. The tiles are defined by the scan size used when creating the stage raster image. However, it is possible to cut the images up into smaller or larger tiles as long as the number of tiles does not exceed 100 and the pixel dimensions used are multiples of 8 (8, 16, 32, 64, 128, 256, 512, etc).


imagegui
File
Data Pre Processing
MVA
Data Display
Image Processing
Import Data
Normalize Data
Crop Image
Filter Image
Cut Up Stage Raster
Align images
Extract ROI
Data Selection Panel
Name of Variable Matrix
From the 'Data Pre Processing' menu select ->'Cut Up Stage Raster'

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

Load Selected Image

Image Matrix: None

Variable Matrix: None

Choose the image name and variable names from the drop down menus and then press the 'Load Selected Image' button.

Name of total counts matrix: Choose one...

Name of sum of selected matrix: Choose one...

Tile resolution

#rows =

#cols=

Cut Up Stage Raster

Launch Tile Data Extractor

Close

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

Load Selected Image

Image Matrix: imagedata_stichscansmall

Variable Matrix: exactmass_stichscansmall

Name of total counts matrix

Choose one...

- Choose one...
- imagedata_stichscansmall
- sumofselected_stichscansmall
- totalcounts_stichscansmall

Tile resolution

#rows =

#cols=

Cut Up Stage Raster

Launch Tile Data Extractor

Close

Choose the correct name for the total counts matrix that corresponds with your image from the 'Name of total counts matrix' drop down menu.

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

Load Selected Image

Image Matrix: imagedata_stichscansmall

Variable Matrix: exactmass_stichscansmall

Name of total counts matrix: totalcounts_stichscansmall

Name of sum of selected matrix: Choose one...

- Choose one...
- imagedata_stichscansmall
- sumofselected_stichscansmall
- totalcounts_stichscansmall

Choose the correct name for the sum of selected peaks matrix that corresponds with your image from the 'Name of sum of selected matrix' drop down menu.

#rows =

#cols=

Cut Up Stage Raster

Launch Tile Data Extractor

Close

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

Load Selected Image

Image Matrix: imagedata_stichscansmall

Variable Matrix: exactmass_stichscansmall

Name of total counts matrix: totalcounts_stichscansmall

Name of sum of selected matrix: sumofselected_stichscansmall

Tile resolution: 256

#rows =

#cols=

Cut Up Stage Raster

Launch Tile Data Extractor

Close

Type in the resolution of the tiles used for the stitched image.

This is the pixel dimension chosen when setting up the stitched image. However, you can enter a different number if you want to cut the image up into different sized tiles.

NOTE: Using a pixel dimension that results in tiles larger than the actual size used for the data acquisition can make it so you have lines in the resulting images at the intersections of the original tiles. This will cause artifacts if you run PCA on the new images tiles.

NOTE: You can use this panel with any image whether or not the data is an actual stitched image.

NOTE: The tile resolution must be a mulitple of 8 and cannot result in more than 100 tiles (10 rows or 10 columns)

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

Load Selected Image

Image Matrix: imagedata_stichscansmall

Variable Matrix: exactmass_stichscansmall

Name of total counts matrix: totalcounts_stichscansmall

Name of sum of selected matrix: sumofselected_stichscansmall

Tile resolution: 256

#rows = 8

#cols= 10

After the tile resolution is entered the number of rows and columns of tiles is shown here.

Cut Up Stage Raster

Launch Tile Data Extractor

Close

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

Load Selected Image

Image Matrix: imagedata_stichscansmall

Variable Matrix: exactmass_stichscansmall

Name of total counts matrix: totalcounts_stichscansmall

Name of sum of selected matrix: sumofselected_stichscansmall

Tile resolution: 256

#rows = 8

#cols= 10

Cut Up Stage Raster

Launch Tile Data Extractor

Close

Press the 'Cut Up Stage Raster' button to begin the cutting process. This can take a while so be patient.

MATLAB R2011b

File Edit Debug Desktop Window Help

Current Folder: C:\Users\graham\Documents\MATLAB

Shortcuts How to Add What's New

Current Folder | Workspace

Stack: Select data to ...

Name	Val
exactmass_stichscansmall	<7
headerinfo_stichscansmall	<7
imagedata_stichscansmall	<5
indimages	
indsumselected	
indtotalcounts	
numcols	
numrows	
sumofselected_stichscansmall	
totalcounts_stichscansmall	

Command Window

New to MATLAB? Watch this Video, see Demos, or read Getting Started.

>>

After the original image matrix is cut up, three new variables are created in the Matlab workspace.
indimages = the individual tile images

indsumselected = the individual sum of selected peaks images

indtotalcounts = the individual total counts images

tiledatatable.xls - LibreOffice Calc

File Edit View Insert Format Tools Data Window Help

Calibri 11

C2 4247

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	label	m/z	im_1	im_2	im_3	im_4	im_5	im_6	im_7	im_8	im_9	im_10	im_11	im_12	im_13
2	unknown	13.1061	4247	4328	4147	4236	4222	4212	4151	4187	4188	4374	4220	4219	41
3	unknown	15.1288	75949	77208	75922	73509	72352	74665	73949	73489	74092	76903	80678	79310	742
4	unknown	19.1374	10746	11605	11050	10959	10913	10758	11064	10787	10812	12309	11836	11880	112
5	unknown	23.1265	232950					148707	1987632	1984805	1969810	1520834	2283084	2700822	23469
6	unknown	39.1342						656369	4619080	4682945	4555796	3291998	4556328	4553361	45429
7	unknown	40.1909	128266					124747	125555	124345	126344	137048	137146	134134	1312
8	unknown	41.1936	3015245					002631	2991713	2994007	3022517	3041495	3220267	3157753	31026
9	unknown	42.2061	533742					543245	538225	537938	536392	563751	586872	582024	5356
10	unknown	43.2188	2586755					491958	2496393	2467029	2555355	2779601	2843559	2700710	26409
11	unknown	44.2258	463300					468557	462576	465096	458516	467321	507274	524398	4781
12	unknown	45.1786	238275					254575	249102	252650	244386	255972	251319	263462	2330
13	unknown	46.2304	18304					19388	18823	18951	18515	20845	19132	20590	190
14	unknown	53.2225	562402					569345	569391	565825	573470	600343	606435	604438	6075
15	unknown	54.2366	291086					281854	289286	283092	294201	325131	323503	304996	3128
16	unknown	55.2386	2409366					403284	2421430	2397276	2467442	2655688	2627441	2534232	25517
17	unknown	57.2629	1608987					535633	1554594	1518170	1616677	1801265	1822782	1652700	16407
18	unknown	58.2534	2215806	2198208	2295464	2198838	2033488	2346040	2267022	2324623	2223884	2059683	2364144	2487227	20540
19	unknown	59.2729	814017	807638	847023	808344	741065	862803	835398	854296	813034	747381	858251	908747	7494
20	unknown	60.2837	544563	541100	574328	549979	506531	594358	575334	589910	559316	510613	578732	615264	5081
21	unknown	63.2126	81871	85839	83966	84717	84206	83037	82470	81827	81426	85810	85840	89852	932
22	unknown	67.2656	953711	1007128	958524	955475	994915	962886	978874	966915	1000278	1084320	1036361	1007661	10604
23	unknown	69.2866	995653	1053679	1009645	1001141	1043818	1015786	1043022	1019723	1075642	1143561	1116956	1052859	11027
24	unknown	70.3065	662816	682830	690766	665668	626958	684104	671454	680162	667572	636149	711106	733660	6463
25	unknown	71.2918	1073131	1115834	1084158	1052543	1046084	1086068	1085702	1073029	1103965	1104751	1220851	1156266	10561
26	unknown	73.2701	111634	103140	100191	99495	95089	99046	100529	99650	110802	106908	112019	108266	1024
27	unknown	77.238	435598	446783	446349	452915	451262	455791	456133	457159	454383	479629	457068	472852	5005
28	unknown	81.2959	597301	639488	611529	620942	644666	617823	634313	619672	645395	703605	659325	639344	7018
29	unknown	83.3131	397711	431610	397063	398751	420616	387713	403283	385533	421220	463527	455930	410757	4508
30	unknown	86.3507	3060932	2968169	3101982	2940474	2706701	3068190	2936445	3012589	2894300	2405385	3154005	3286163	26741
31	unknown	87.3307	329792	322508	334331	317186	289676	331589	316348	324168	312245	265023	345437	362282	2919
32	unknown	89.2895	49444	49790	51226	50412	48443	52279	51250	51631	50665	51656	51914	54496	521
33	unknown	91.2665	455227	469008	473821	492046	487025	492999	493004	493835	488102	590166	474524	503129	5551
34	unknown	104.379	1036491	990575	1046913	993540	892325	1041590	993471	1020181	977455	843868	1095075	1140921	9136
35	unknown	125.249	455213	449668	467288	445813	414813	472183	452886	464075	443098	397234	476800	510813	4190
36	unknown	134.37	23057	24239	24073	24901	24418	24083	24015	23710	24055	38979	24718	25431	279
37	unknown	135.386	34041	35623	34549	36315	37391	34502	35870	34658	36766	47283	37138	36747	430
38	unknown	147.32	267621	265516	256883	241130	220527	227844	207691	208624	211286	160787	268262	305737	2391
39	unknown	166.377	424667	401085	419656	393549	357598	427930	411964	424774	402064	381419	440936	456421	3533
40	unknown	184.436	1715798	1609190	1666546	1551476	1385198	1615980	1572556	1605255	1535350	1488352	1746239	1767619	14174

A spreadsheet is also created in the active Matlab directory called 'tiledatatable.xls'.

This spreadsheet contains the integrated peaks areas for all peaks for each individual tile image

This spreadsheet can be saved as a tab deliminted text file (.txt) and then imported into the spectragui.

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

Load Selected Image

Image Matrix: imagedata_stichscansmall

Variable Matrix: exactmass_stichscansmall

Name of total counts matrix: totalcounts_stichscansmall

Name of sum of selected matrix: sumofselected_stichscansmall

Tile resolution: 256

#rows = 8

#cols= 10

Cut Up Stage Raster

Launch Tile Data Extractor

Close

Press the 'Launch Tile Data Extractor' button to open a window that will allow you to select individual tile images.

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

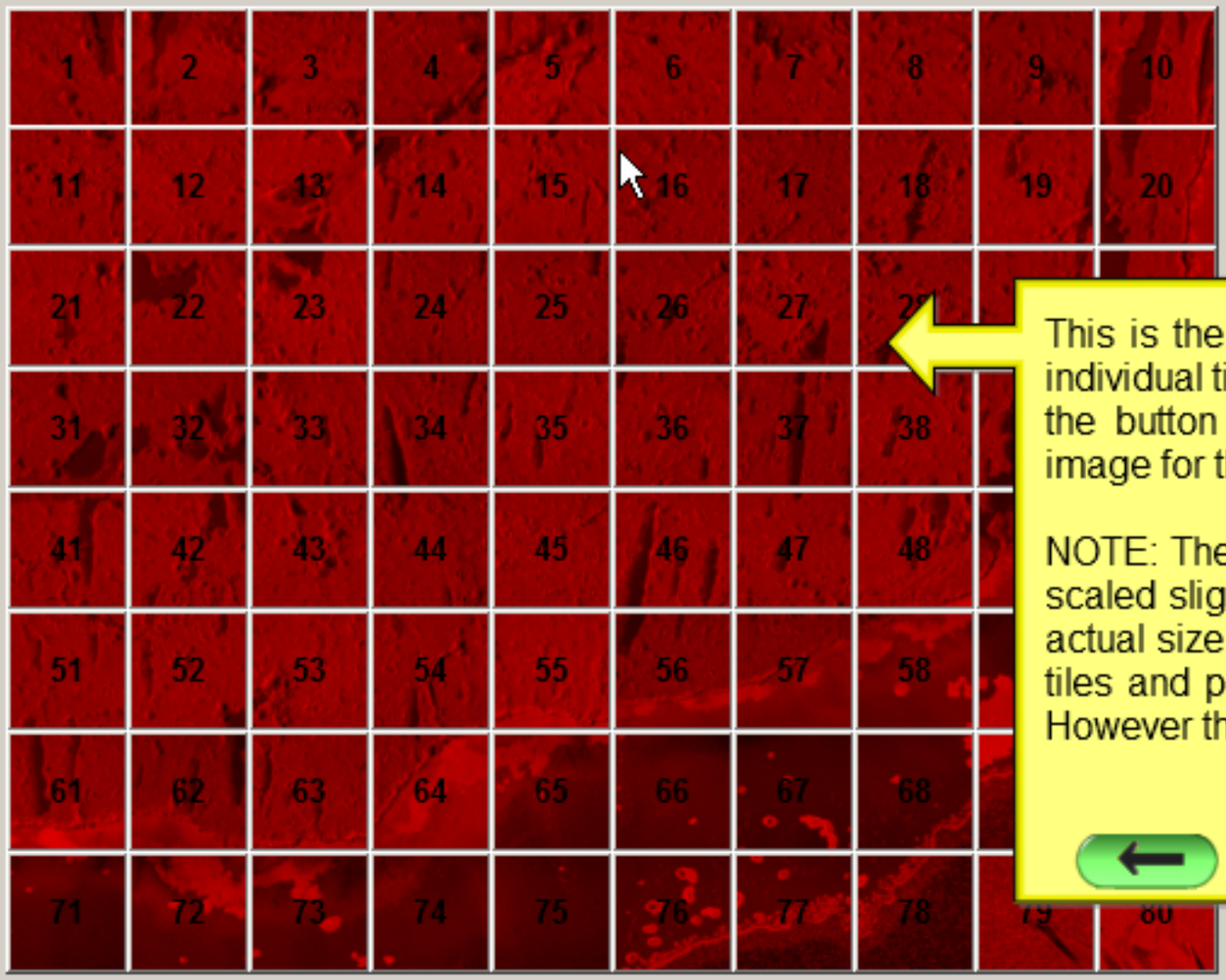
Name of Image Matrix

imagedata_stich

Name of Variable Matrix

exactmass_stichsc

tileimageextractorgui



This is the Tile Image Extractor. Each individual tile is a button. The image on the button represents the total counts image for that tile.

NOTE: The image on each tile may be scaled slightly smaller or larger than it's actual size depending on the number of tiles and pixel dimensions of each tile. However the data is stored correctly.

close

imagegui

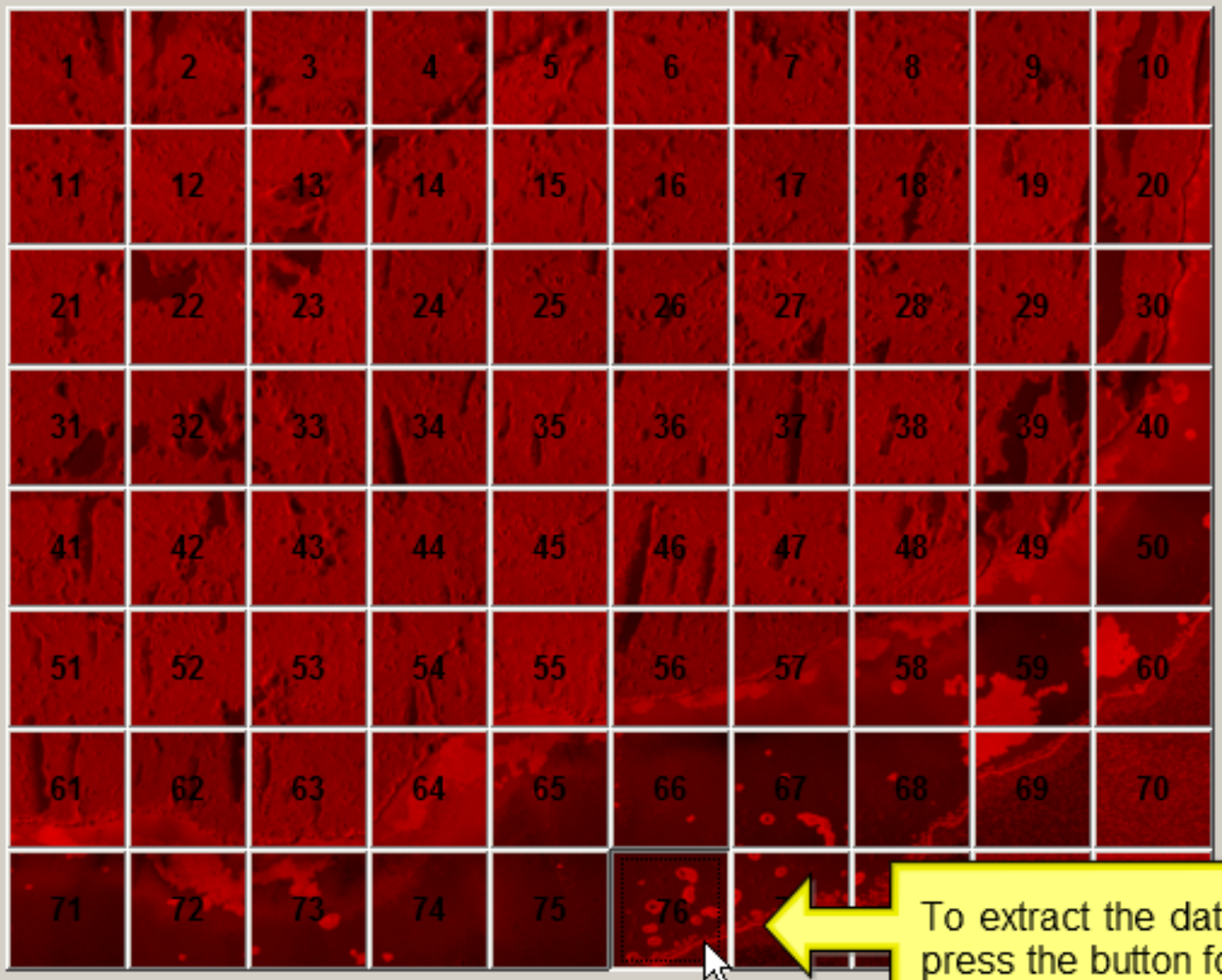
File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix

Name of Variable Matrix

tileimageextractorgui



To extract the data for a given tile, simply press the button for the tile data you want. Here we press the tile 76 button.

close

MATLAB R2011b

File Edit Debug Desktop Window Help

Current Folder: C:\Users\graham\Documents\MATLAB

Shortcuts How to Add What's New

Current Folder | Workspace

Stack: Select data to ...

Name	Val
exactmass_stichscansmall	<7
headerinfo_stichscansmall	<7
imagedata_stichscansmall	<5
imagedata_tile76	<6
indimages	
indsumselected	
indtotalcounts	
numcols	
numrows	
sumofselected_stichscansmall	
sumofselected_tile76	
totalcounts_stichscansmall	
totalcounts_tile76	<6

The image data, total counts and sum of selected data for that tile are extracted and put into new variables within the Matlab workspace.

Command Window

New to MATLAB? Watch this Video, see Demos, or read Getting Started.

>>

MATLAB R2011b

File Edit Debug Desktop Window Help

Current Folder: C:\Users\graham\Documents\MATLAB

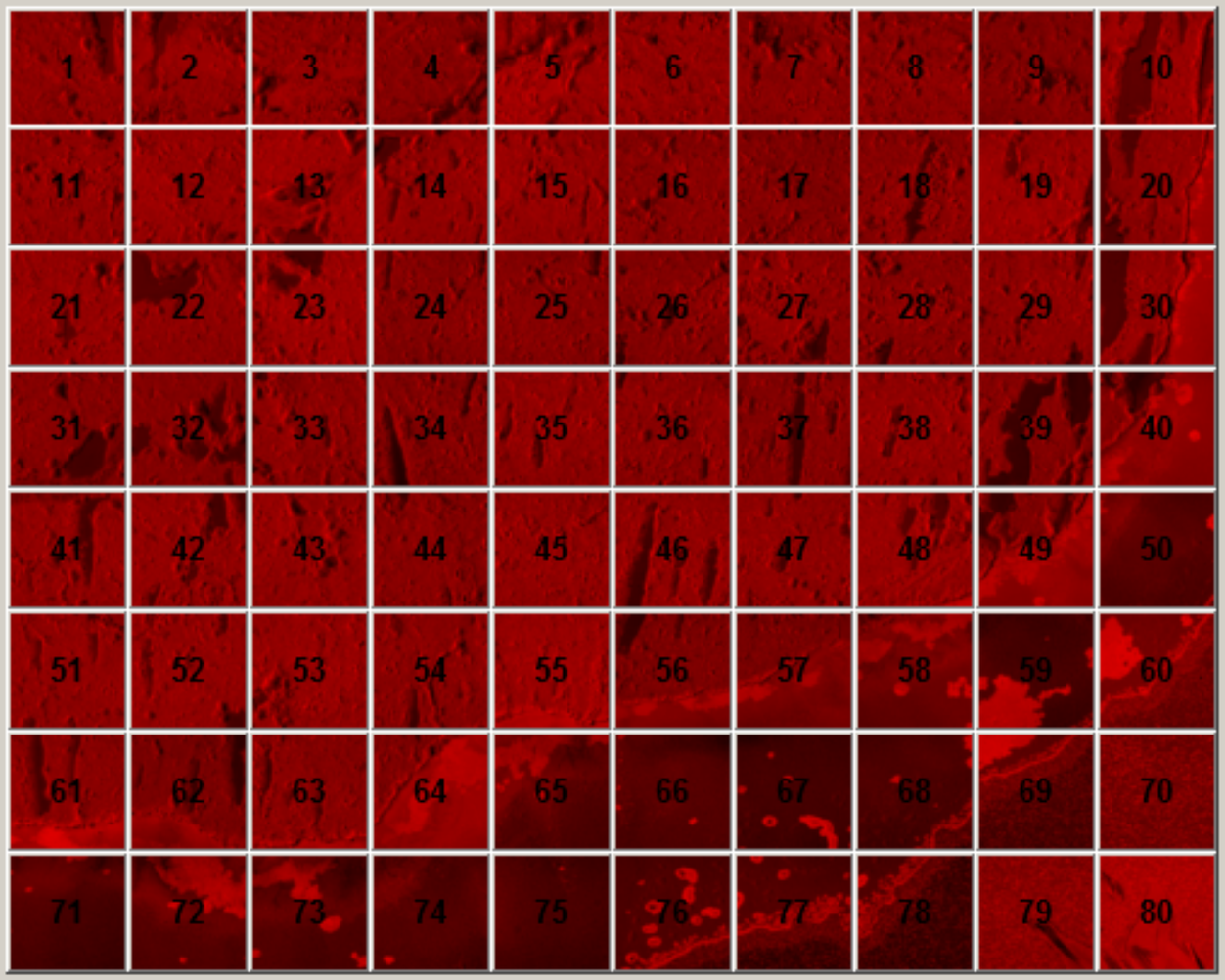
Shortcuts How to Add What's New

Current Folder | Workspace | Command Window

Name

exactmass_stich
headerinfo_stich
imagedata_stich
imagedata_tile7
indimages
indsumselected
indtotalcounts
numcols
numrows
sumofselected_s
sumofselected_t
totalcounts_stich
totalcounts_tile7

tileimageextractorgui



close

Once you have extracted the images you want you can close this window by pressing the 'close' button.

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_tile7...

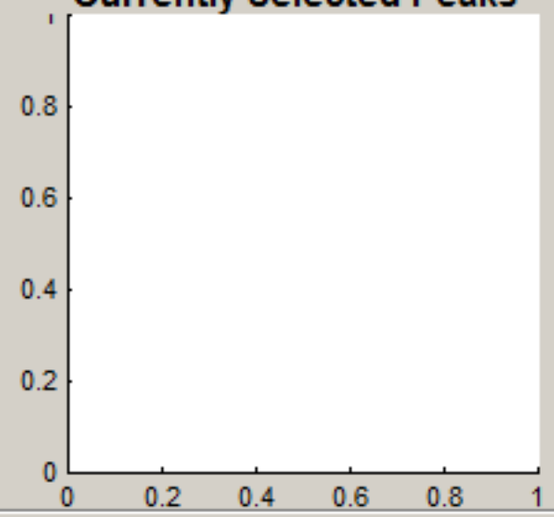
Name of Variable Matrix: exactmass_stichsc...

Load Selected Data

Image: imagedata_tile76

Variables exactmass_stichscansmall

Currently Selected Peaks



Browse all Peak Images

Variable List

369.85
411.828
439.876
467.918
493.954
495.967
522.002
524.015
550.048
552.058
576.087
578.064
580.046
602.106
604.088
606.056
608.054

Variables to Plot

13.1061
15.1288
19.1374
23.1265
39.1342
40.1909
41.1936
42.2061
43.2188
44.2258
45.1786
46.2304
53.2225
54.2366
55.2386
57.2629
58.2534

Data (actual counts)

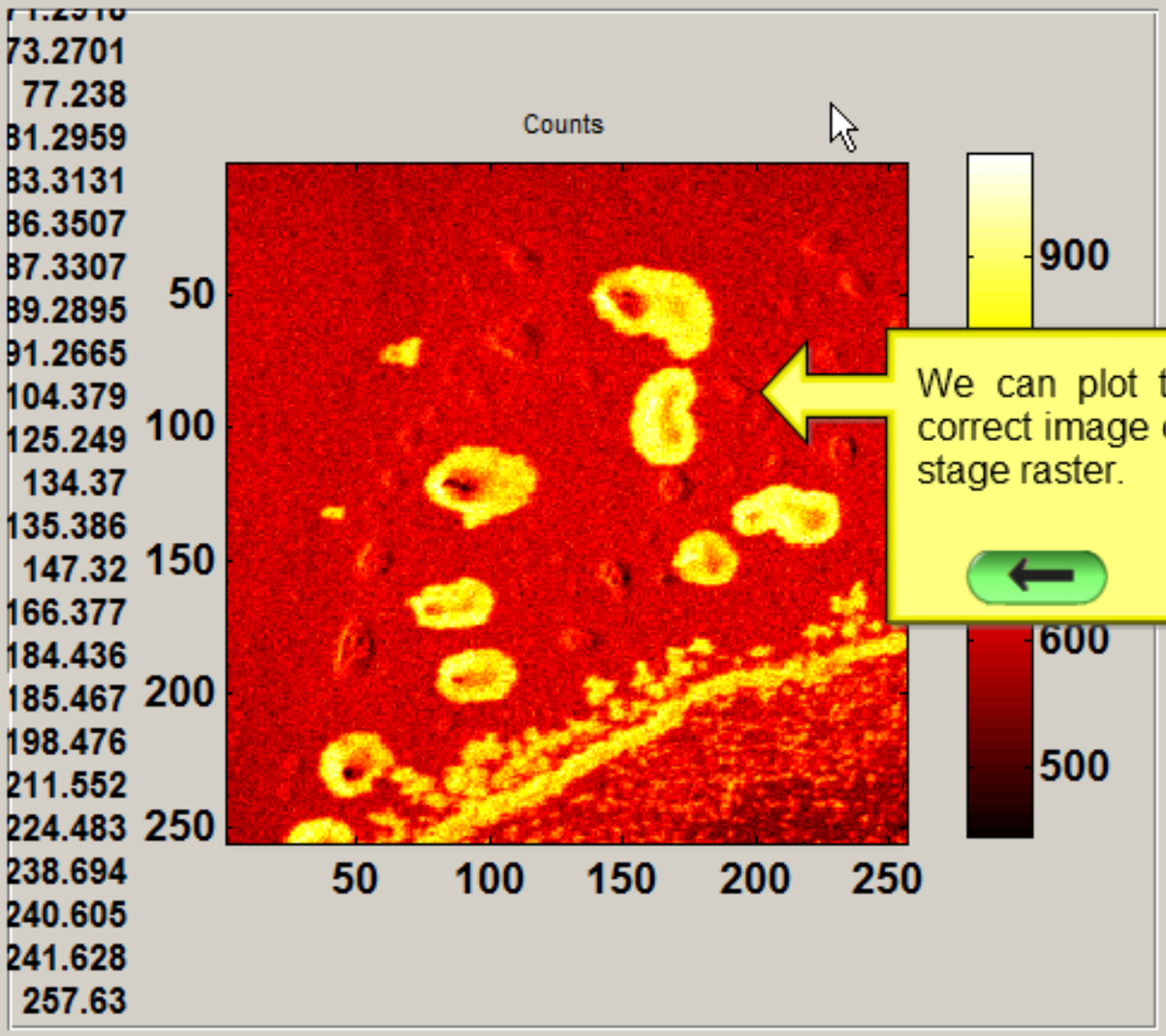
Add to Plot

Reset Plot

Name for Combined Selected Variable Image

Save Combined Variable Image

Close Panel



We can plot the data and see that the correct image data was extracted from the stage raster.

Create ext Figure

Save Plot to File

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

Load Selected Image

Image Matrix: imagedata_stichscansmall

Variable Matrix: exactmass_stichscansmall

Name of total counts matrix: totalcounts_stichscansmall

Name of sum of selected matrix: sumofselected_stichscansmall

Tile resolution: 512

#rows =

#cols=

Cut Up Stage Raster

Launch Tile Data Extractor

Close

It is also possible to use a different tile resolution and cut the image into different sized tiles.

As stated before, if you makes the tiles larger you may see the lines from the original tiles in the image. This will likely cause artifacts if you run MVA on the larger tiles.

Let's try using 512 as the tile resolution.

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

Load Selected Image

Image Matrix: imagedata_stichscansmall

Variable Matrix: exactmass_stichscansmall

Name of total counts matrix: totalcounts_stichscansmall

Name of sum of selected matrix: sumofselected_stichscansmall

Tile resolution: 512

#rows = 4

#cols= 5

Now there are 4 rows and 5 columns instead of 8 and 10 as expected.

Cut Up Stage Raster

Launch Tile Data Extractor

Close

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

Load Selected Image

Image Matrix: imagedata_stichscansmall

Variable Matrix: exactmass_stichscansmall

Name of total counts matrix: totalcounts_stichscansmall

Name of sum of selected matrix: sumofselected_stichscansmall

Tile resolution: 512

#rows = 4

#cols= 5

Cut Up Stage Raster

Launch Tile Data Extractor

Close

Press the 'Cut Up Stage Raster' button as before.

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

Load Selected Image

Image Matrix: imagedata_stichscansmall

Variable Matrix: exactmass_stichscansmall

Name of total counts matrix: totalcounts_stichscansmall

Name of sum of selected matrix: sumofselected_stichscansmall

Tile resolution: 512

#rows = 4

#cols= 5

Cut Up Stage Raster

Launch Tile Data Extractor

Close

Now let's press the 'Launch Tile Data Extractor' to see what the new tiles look like.

imagegui

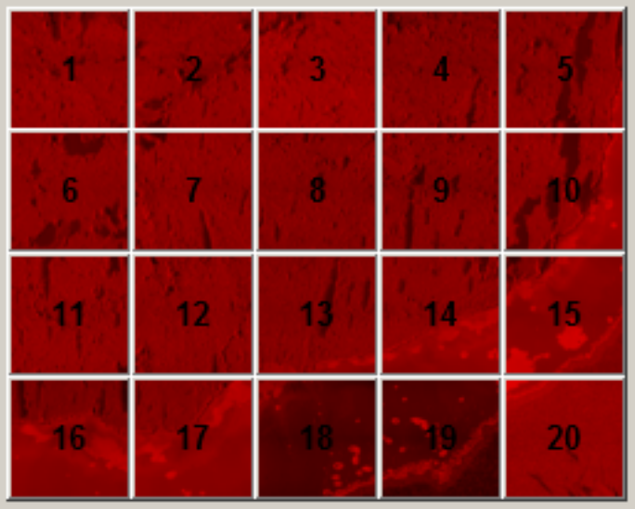
File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

tileimageextractorgui



We now have fewer buttons since the images are now 512 x 512 pixels.

NOTE: The button size does not scale with the pixel dimensions so even though the resulting tile images are larger than before they are fit onto the same sized buttons.

close

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_stich...

Name of Variable Matrix: exactmass_stichsc...

tileimageextractorgui

Let's look at tile 18 which includes the tile we looked at previously.

close

Image M

Variable

Name

totalc

Name

sumof

Tile

#r

#

Cut

Launch

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix: imagedata_tile1...

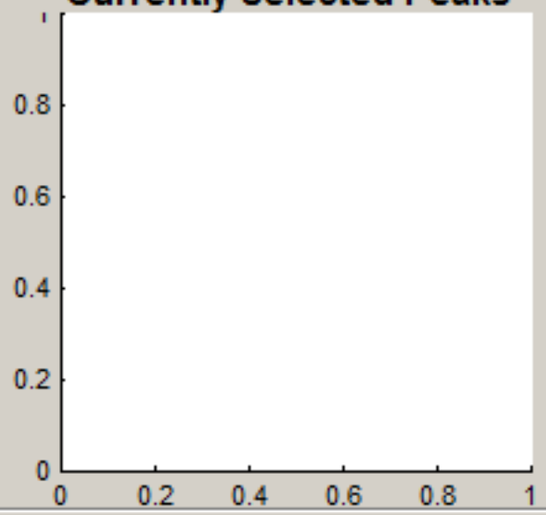
Name of Variable Matrix: exactmass_stichsc...

Load Selected Data

Image: imagedata_tile18

Variables exactmass_stichscansmall

Currently Selected Peaks



Browse all Peak Images

Variable List

369.85
411.828
439.876
467.918
493.954
495.967
522.002
524.015
550.048
552.058
576.087
578.064
580.046
602.106
604.088
606.056
608.054

Variables to Plot

13.1061
15.1288
19.1374
23.1265
39.1342
40.1909
41.1936
42.2061
43.2188
44.2258
45.1786
46.2304
53.2225
54.2366
55.2386
57.2629
58.2534

Data (actual counts)

Add to Plot

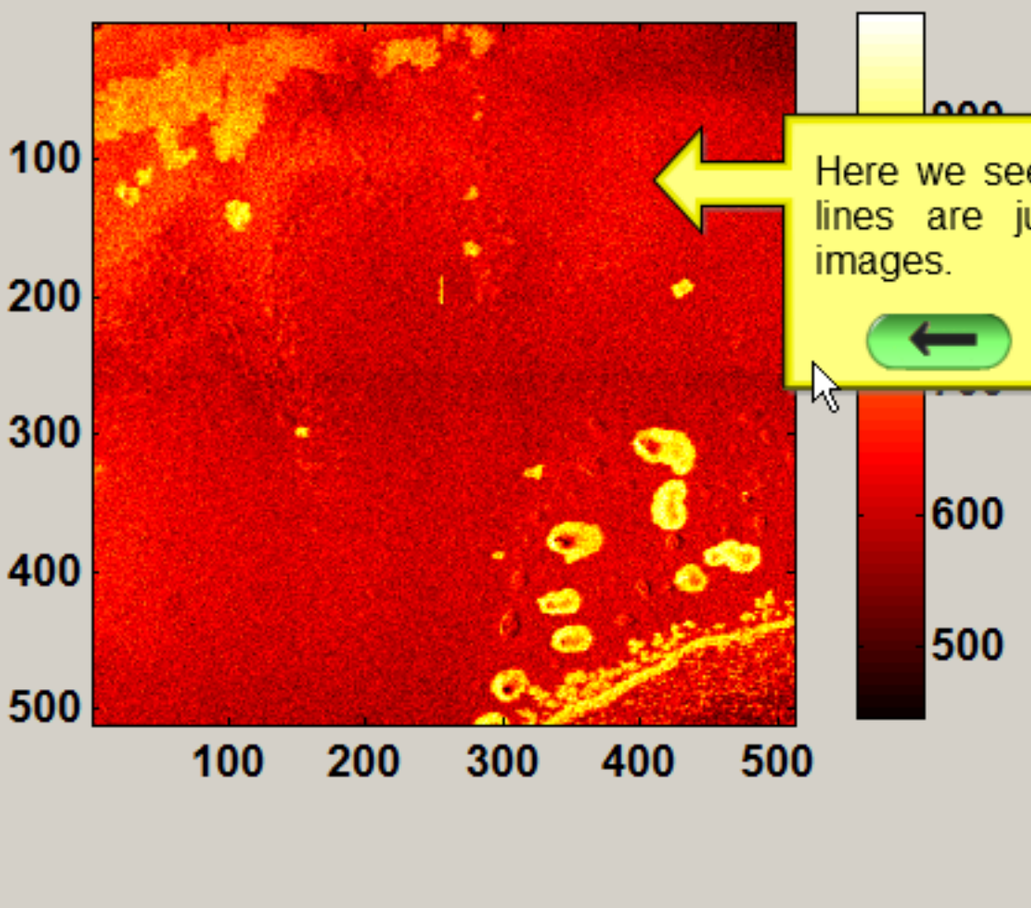
Reset Plot

Name for Combined Selected Variable Image

Save Combined Variable Image

Close Panel

73.2701
77.238
81.2959
83.3131
86.3507
87.3307
89.2895
91.2665
104.379
125.249
134.37
135.386
147.32
166.377
184.436
185.467
198.476
211.552
224.483
238.694
240.605
241.628
257.63



Here we see the new tile data. The tile lines are just barely visible for these images.

Create ext Figure

Save Plot to File

imagegui

File Data Pre Processing MVA Data Display Image Processing

Data Selection Panel

Name of Image Matrix imagedata_stich...

Name of Variable Matrix exactmass_stichsc...

That's it for this tutorial.

Press the green button on the left to go back to the previous step. Press the button the right to go back to the beginning of the tutorial.