

Volker Bäcker

ImageJ User & Developer Conference



Introduction



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imaging facility

ANDUS

- image analysis solutions
 - ImageJ macro tool sets
 - options and default values
 - help page on redmine
 - installation
 - usage
 - example images
 - interactive version
 - batch version





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interactive version	🛞 🗈 list editor			
 keyboard shortcuts 	/media/DONNEES/mri/in/omx/hela-cells.tif /media/DONNEES/mri/in/omx/mitosis.tif			
batch version	/media/DONNEES/mri/in/omx/wt_ChS_MyoG_RI510_002_pt_6.dv			
 specify input / output 	add remove selected close			
MACRO_IO_SETTINGS	select			
 show progress / exceptions 	10-10-2012 15:55:8.259 Processing file 2 of 2			
♦ log-off	Processing cell 1 of 1 /media/DONNEES/mri/projec Isave as tiff			
macro "Next Image [f4]" { nextImageAction();	hela-cells-cell-1a Iog off after processing hela-cells-cell-2a			
}	OK Cancel			
$\Box \bigcirc \square \heartsuit / \checkmark \ddagger \ddagger $. A 🥄 <"? /< < > > § A E ≫			
Next Image (f4)				

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Input images:

- ◆ OMX, deltavision, 4D, big
- export regions of interest
 - 4D, .ics or tif, matlab or huygens (hrm)
- solution
 - setup list of input images / output folder
 - use loci with virtual stack option
 - navigate between images
 - make multiple selections per image

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- saved automatically
- export regions in batch mode
- close session

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? E ş А \leq <C > >>> Wt_ChS_MyoG_RI510_002_pt_6.dv (V) (75%) c:1/2 z:16/31 t:1/180 (c:1/2 z:16/31 t:1/180 - /media/DONNEE 1 Size Name zK 346.2 MB wt Chs_myou_kisto_ouz_pt_o-cett-ta.ICS wt ChS MyoG RI510 002 pt 6-cell-2a.ics 435.0 MB wt ChS MyoG RI510 002 pt 6-cell-3a.ics 421.0 MB







count cells and measure areas

- pre-processing
 - simple segmentation
 - grayscale watershed segmentation



p	5	w				>>
	80	Simple	Adip	ocytes	Segr	ne
		mii	n. size	40		
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				OK	Can	cel

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measure surface of green pixels

- per well and image
 - in batch mode





	Label	Area
1	/media/DONNEES/mri/in/seed_lings/A008d05-0-0.JPG	340603
2	/media/DONNEES/mri/in/seed_lings/A008d05-1-0.JPG	303846
3	/media/DONNEES/mri/in/seed_lings/A008d05-2-0.JPG	233997
4	/media/DONNEES/mri/in/seed_lings/A008d05-0-1.JPG	52801
5	/media/DONNEES/mri/in/seed_lings/A008d05-1-1.JPG	147495
6	/media/DONNEES/mri/in/seed_lings/A008d05-2-1.JPG	117679

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- difficult to detect as particles
- solution:
 - count endpoints and divide by two
- algorithm
 - subtract blurred version
 - apply Gaussian-blur
 - IsoData-auto-threshold
 - skeletonize

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 find points with exactly one neighbour (macro)

🜔 Count Segr	ments [
subtract radius	10
filter radius	3
min. size	60
ОК	Cancel





drg9crb3sh1cov3_p79c3.TIF

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10 /media/DONNEES/mri/



Leaf Infection Tool



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0.51454



virus with two stainings (gfp and rfp), one virus blocks cell for others, knock down of genes of the plant

- Tools:
 - user loads the two channels
 - a adjust display
 - user selects rectangle around a leave and adds it to the roi-manager
 - user copies the area, selects the leaf and adds it to the roi-manager

leaf-area	GFP-area	RFP-area	over
37.5604	11,1811	24.0379	3.38
38.9424	16.0831	18.1418	3.25
42.4002	15.9781	14.0183	7.86

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	79.	10 8 (120049	.617	90761.	4767	-0.36	676

Macro Tool Sets for Biological Image Analysis volker.baecker@mri.cnrs.fr Page 8

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general options

- measure vertical lines from extrema
- interdigitation index
- thickness perpendicular random lines
- everything in batch mode
- roi converter tools
 - upper border of 2d-roi to 1d-roi
 - extrema of 1d-roi to point-roi
 - vertical lines from 1d-rois

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Wound Healing



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measure speed of wound healing

variance or find edges based



😕 🗆 Wound Healing Tool Op				
method	variance 🗆			
variance filter radius	10			
threshold	1			
radius open	4			
min. size	100000			
	DK Cancel			

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Summery and Outlook



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- macro tool sets for biological image analysis
- redmine for documentation and issue tracking (dev.mri.cnrs.fr/projects/imagej-macros)
- single tools kymograph



3d with FIJI – microtubule network



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further tool sets



- use Remote ImageJ to run processing on remote machines
- run processing from web-interface Web Image and Data Environment (WIDE)



Thank you!

QUESTIONS?



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MRI – TIGR

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