Easy Focus, a Macro for "ImageJ"

Version 1.5.x   Bureau H. Glünder 2019 / 2020

WHAT FOR

Easy Focus is an "ImageJ"-Macro that returns the best focused slice of a stack that represents a focus series. The stack may contain a single focus series (z-stack), a temporal sequence of focus series (4D-hyperstack), or focus series of colour channels (4D-hyperstack).
Easy Focus-analyses can be spatially restricted to arbitrary rectangular selections (ROIs).
Easy Focus-analyses are RGB-agnostic and cannot be applied to 5D-hyperstacks.

INSTALL

Download "EasyFocus_1-5-x.zip" and unzip it.   (Step-by-step installation guide for "Fiji")

Launch "ImageJ" and install the file **Focus_LP.class** per menu item "Plugins ▷ Install…" or move it to the "plugins"-folder of your "ImageJ"-installation.

Move the file **Easy Focus.ijm** to the folder "ImageJ ▷ plugins ▷ macros".
- ❍ Do **not** copy the file to the folder "ImageJ ▷ macros"!
  If the folder "macros" does not exist in the folder "plugins", then create it.

Quit and re-launch "ImageJ".

HOW TO

Open an image-stack holding a single focus series, or a 4D-hyperstack holding a temporal sequence of focus series, or a 4D-hyperstack holding focus series of colour channels.

If the focus analysis is to be spatially restricted, then create a suitable rectangular selection (ROI).

ImageJ : Choose the item "Easy Focus" from the "Plugins"-submenu "macros".

Fiji :   Choose the item "Easy Focus" from the "Plugins"-submenu "Macros".

Result:
- ❍ The returned 16bit image or image-stack shows the slice(s) that is/are determined as being best focused with respect to the analysis of the whole image or of the selection (ROI).
- ❍ Its/their position(s) in the original stack is/are displayed in the subtitle bar(s).
- ❍ **Important note:**
  The best focused slice needs not be perfectly in focus because it merely is the *relatively* best focused slice of a focus series according to a kind of spatial *majority decision* regarding the focus of the slice or selection. Consequently, the results will strongly depend on the depth-resolution of the focus series and on the image content.
  Especially for imaged 3D-objects, regional focus analyses (using small ROIs) provide more meaningful results than global ones.

Details:
- ❍ Please consult the description of the "ImageJ"-Plugin Focus LP that represents the core of "Easy Focus".
   ("Easy Focus" uses the "Standard"-criterion with "Size 9"-kernel.)
- ❍ For different parameter settings, hold down the "alt"-key when launching "Easy Focus".
   (Changed parameter settings are not persistent.)

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Easy Focus calls an "ImageJ"-Plugin that comes with "EasyFocus_1-5-x.zip".
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