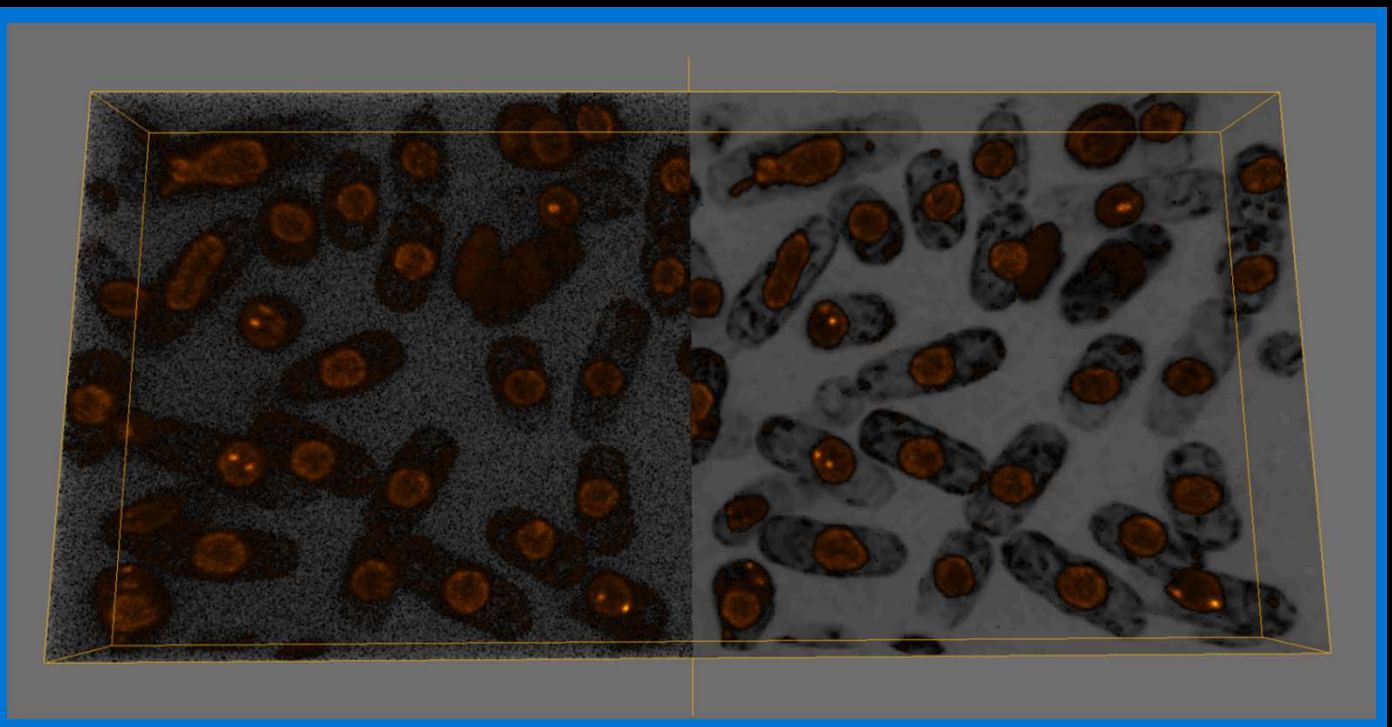
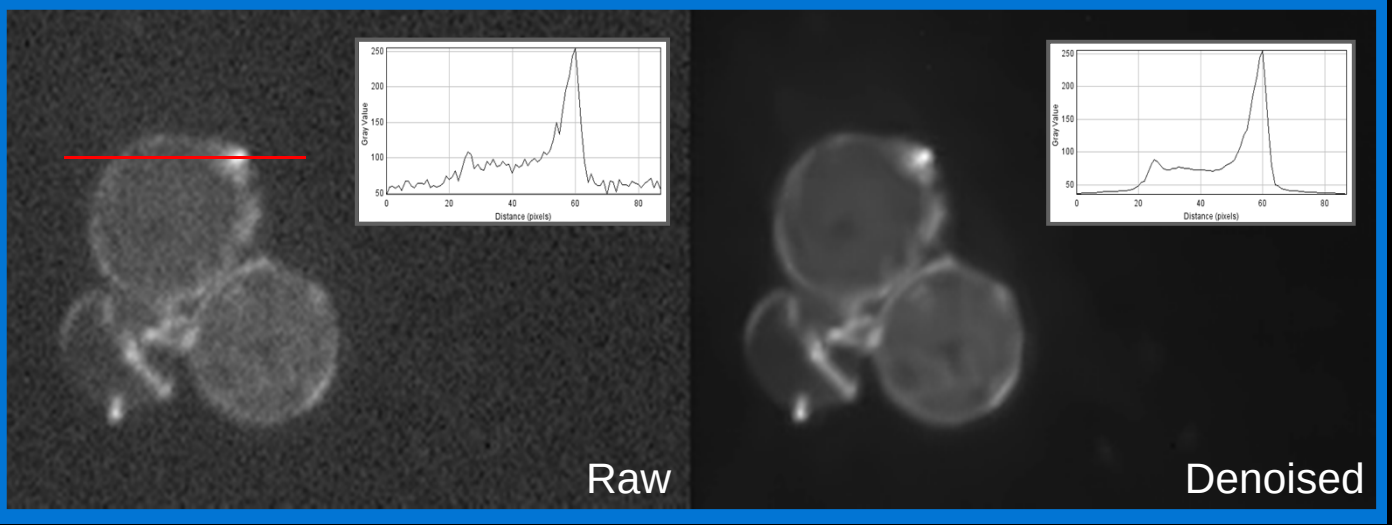
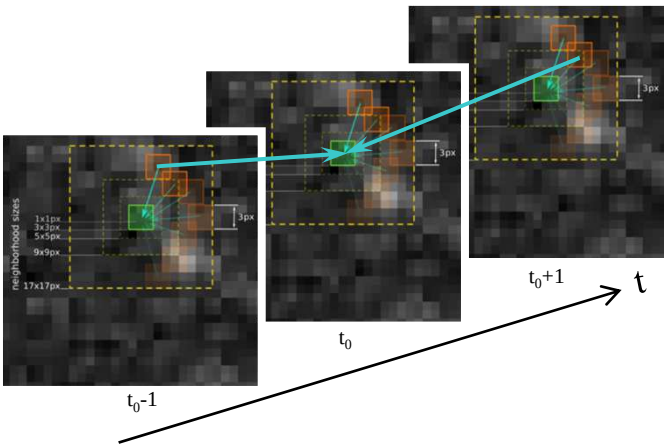
ROPER SCIENTIFIC™

Safir
Denoising

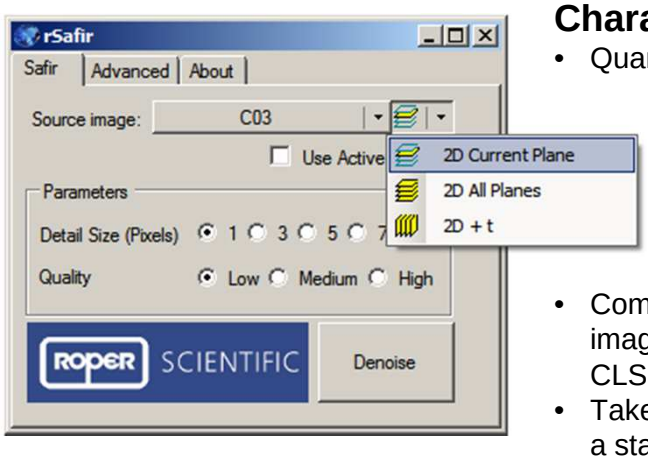
New denoising algorithm for fluorescence microscopy







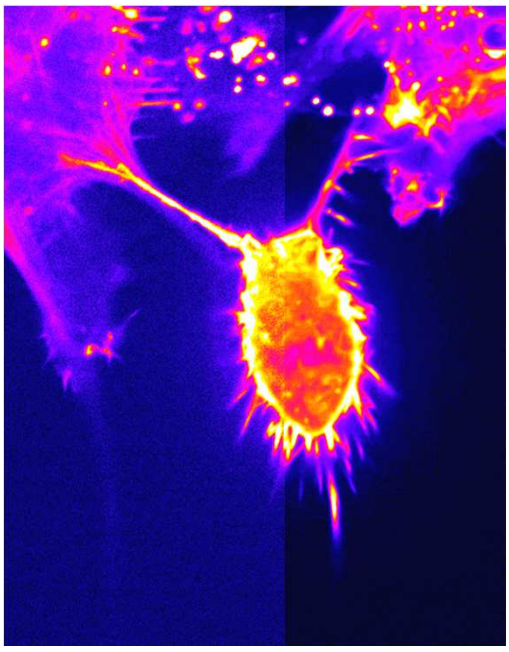
Safir is a 2D+t patch-based denoising software developped by Roper Scientific and running into Metamorph™ acquisition software.
It is based on an published algorithm:
Patch-based nonlocalfunctionnal for denoising fluorescence microscopy image sequences. Boulanger J, Kervrann C, Bouthemy P, Elbau P, Sibarita JB, Salamero J. IEEE Trans Med Imaging 2010 Feb



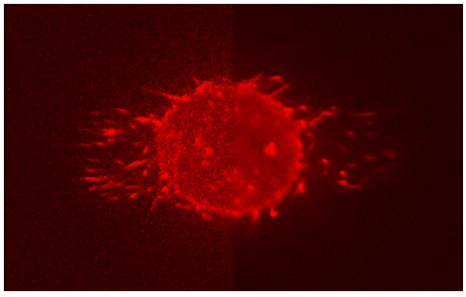
Characteristics:

- Quantitative algorithm
  - Keep intensity levels
  - Keep high spatial frequency signals
  - Can be used before other post-processing algorithm (ie Déconvolution)
- Compatible with almost all kind of images (Wide-field, TIRF, Spinning disk, CLSM)
- Takes about 1s for a 512x512 image on a standard computer
- Batch processing or online denoising through Metamorph journals
- Increases a lot your S/N in low light condition (**up to 100 times**). Thus excitation power can be lowered by the same amount to reduce **phototoxicity**

  ➢ **Image longer**
  ➢ **Increase your frame rate**



Safir used on cells expressing lifeact-mCherry. The LUT has be changed to get a better view on low light levels. (Left raw, right denoised).



Safir used on cells expressing lifeact-mCherry and EB3-GFP, during mitosis. A large area of actin filaments has been ablated before chromosome segregation (shown in A left raw images, right denoised). B shows the post ablation sequence (left raw, right denoised) revealing a new behavior of the cell mitosis.

Front page legends:

Top:

Asynchronous culture of Schizosaccharomyces pombe expressing the nuclear envelope protein Cut11-GFP under the control of the endogenous promoter.

Silvia Salas Pino , Dr.Rafael Rodríguez Daga's lab, Andalusian Center for Developmental Biology

Bottom:

C-elegans spermatozoids expressing MSP-RFP-T (Major sperm protein) crawling on a glass substrate. Here, illumination is critical because of th photostability and the high number of frames required. Moreover, the lower the illumination is the lower will be the impact on the cell behavior.

Membrane tension regulates motility by controlling lamellipodium organization. Batchelder EL, Hollopeter G, Campillo C, Mezanges X, Jorgensen EM, Nassoy P, Sens P, Plastino J. PNAS 2011 Jul

For more information on *Safir :*

HEAD OFFICE
Roper Scientific, SAS
Z.I. Petite Montagne Sud
8, rue du Forez
91017 Evry Cedex, France
Tel: +33 160860365
Fax: +33 160860709