

## **Integrating Flexible and Efficient Image Acquisition with Open Software**

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Over the past twenty years there has been an increasing use of live-cell imaging to study dynamic processes in diverse biological preparations. One of the main challenges in fluorescent live-cell microscopy is reducing photo-damage. Others are coming from the fact that they are living: they undergo their live cycle, they move and morph. The acquisition must adapt to it (change focus, laser intensity, stage position or make some decision based on live analysis). The appearance of novel microscopy techniques (such as SMLM, SPT, SIM, SPIM) make the live-cell experiments even more complex. Such experiments are a challenge for acquisition hardware and software – it must be flexible on one hand to fulfill all these requirements and yet efficient in order to get most photons while inducing least possible photo-damage.

Recently, many open software platforms appeared alongside commercial software solutions enabling the researchers to implement their own algorithms relatively quickly and easily. As it becomes obvious that it is impossible to implement everything either in commercial or open software the necessity to bridge this gap is more and more imminent.

In this presentation two NIS Elements advanced acquisition modules are shown: the “Illumination Sequence” and “JOBS”. Focus is put on integration with Open Source solutions.