

Napari-live-recording: embedding camera acquisition in napari

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Abstract

Custom-built microscopes often require to control hardware objects directly. An high-complexity device group is cameras. Moreover, camera producers provide softwares which often lack the features needed to properly perform measurements as intended. The scientific community responded to this need by providing open-source solutions such as Micro-Manager[1], who pioneered the field, or python-microscope[2] to control cameras using a common interface. In this context, we present napari-live-recording, a plugin for napari[3]. The plugin aims to converge acquisition and analysis together, so to bring data analysis directly to the workbench for quick data evaluation. We aim to integrate a real-time image processing pipeline taking frames directly from cameras, showing results on image viewer or storing them using file formats such as TIFF and HDF5. Moreover, the plugin aims to converge existing camera control options into a single solution, by integrating the afore-mentioned Micro-Manager and python-microscope device layers within the plugin itself. The plugin architecture also allows scientists to integrate their own custom camera devices quickly and easily, minimizing the time to deploy new cameras or expanding the control over existing equipment. The plugin development is founded by the Chan-Zuckerberg Initiative through the "napari Plugin Foundation Grants (Cycle 2)" program.

References

1. Arthur D Edelstein, Mark A Tsuchida, Nenad Amodaj, Henry Pinkard, Ronald D Vale, and Nico Stuurman (2014), Advanced methods of microscope control using μ Manager software. *Journal of Biological Methods* 2014 1(2):e11 doi:10.14440/jbm.2014.36
2. David Miguel Susano Pinto, Mick A. Phillips, Nicholas Hall, Julio Mateos-Langerak, Danail Stoychev, Tiago Susano Pinto, Martin J. Booth, Ilan Davis, Ian M. Dobbie; Python-Microscope – a new open-source Python library for the control of microscopes. *J Cell Sci* 1 October 2021; 134 (19): jcs258955. doi: <https://doi.org/10.1242/jcs.258955>
3. napari contributors (2019). napari: a multi-dimensional image viewer for python. doi:10.5281/zenodo.3555620