

## Endrov - A New Framework for Microscopy and Image Analysis

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The current software for microscopy has many short-comings. Stability and portability for one, but the schema is often not sufficient. Programs like ImageJ has limited 3D/4D support and does not easily support new types of annotation or metadata. File formats are also limiting as they are plentiful and commonly cannot store more than raw image data.

We have developed a new framework ([www.endrov.net](http://www.endrov.net)) that covers the entire microscopy chain:

- A new open file format (OST) which handles arbitrary metadata and annotation, 6D recordings (3D+channel+time+well), mixed resolutions and compression (lossy and lossless). It is based on existing standards and is simple to implement. Access time is fast even for very large datasets.
- Methods to make existing microscopy software support complex recording schemes and output into our format (or other formats).
- An extensible framework to view, annotate, process and analyze recordings. It is a plug-in framework written in Java and hence works on all operating systems. Endrov can be used as a library, making heavy data analysis simple. Most common proprietary formats are also supported through Bio-formats. The OME framework is also supported.
- Scripting in Java and a simple graphical language
- Our framework is open and free. Runs for sure on Linux, OSX and Windows.
- Currently we are adding support for direct control of the microscope, a bioinformatics platform and efficient storage of data on central servers

As an application, we have used our framework to follow the lineage in *C.elegans* embryos [1], and to quantify gene expression levels.

[1] J Hench, J Henriksson, M Luppert, and T Bürglin (2009) Spatio-temporal Reference Model of *Caenorhabditis elegans* Embryogenesis with Cell Contact Maps. Submitted.

