

## KNIP–KNIME Image Processing and Analysis

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<http://tech.knime.org/community/image-processing/>

### Abstract

The increase in high-throughput microscopy in recent years has resulted in much richer data being available for image analysis. This calls for software solutions that are able to handle the huge amounts of image data produced in a high-throughput environment. Such a software must provide a wide range of functionality (e.g. image analysis, machine learning, statistics and visualisation), and yet still be easy to use by non-experts.

KNIME is a user-friendly and comprehensive open-source data integration, processing, analysis, and exploration platform designed to handle large amounts of heterogeneous data. It therefore satisfies the aforementioned requirements. As an integration platform, KNIME directly combines functionality from several different domains.

More recently the image processing plugin KNIP has been developed. It is designed to extend KNIME by providing algorithms and data structures that can easily process and analyse images and videos on a large scale. The addition of image processing capabilities to KNIME means that complex domain comprehensive workflows can be designed without difficulty, enabling for instance the analysis of images with machine learning algorithms or the completion of image data with chemical information. Further advantages directly inherited from KNIME, amongst many others, are the handling of large amounts of images and fast prototyping of understandable workflows.

Avoiding redundant development, KNIP in turn uses and integrates state-of-the-art libraries like ImageJ1 and ImageJ2, Bioformats, OMERO and ImgLib2. Additionally KNIP provides powerful functionality itself. Currently KNIP is used to solve several segmentation, classification and tracking problems in different areas of science, such as biology, chemistry and physics.

### Keywords

High-throughput analysis, image processing, image analysis, screening, imagej, imagej2,

