ImageJ2–ImageJ for the Next Generation of Biological Image Data

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Abstract

Any successful software project, after a period of sustained growth and the addition of functionality outside the scope of the program's original intent, will benefit from a subsequent period of scrutiny and refactoring, and ImageJ is no exception. ImageJ2 is a new version of ImageJ seeking to strengthen both the software and its community. Internally, it is a total redesign of ImageJ, but it is backwards compatible with ImageJ 1.x via a "legacy layer" and features a user interface closely modeled after the original. Under the hood, ImageJ2 completely isolates the image processing logic from the graphical user interface (UI), allowing ImageJ2 plugins to be used in many contexts, including headless in the cloud or on a server such as OMERO, or from within another application such as KNIME, ICY or CellProfiler (a Python application). ImageJ2 has an N-dimensional data model driven by the powerful ImgLib2 library, which supports image data expressed in an extensible set of numeric and non-numeric types, and accessed from an extensible set of data sources. ImageJ2 is driven by a state-of-the-art, collaborative development process, including version control, unit testing, automated builds via a continuous integration system, a bug tracker and more. We are collaborating closely with related projects including Fiji, Bio-Formats and OMERO, and are striving to deliver a coherent software stack reusable throughout the life sciences community and beyond. The result is well-designed, community-driven software accessible to users yet powerful enough for programmers.

Biography

Curtis Rueden is a software architect, and lead programmer of the software projects at the Laboratory for Optical and Computational Instrumentation (LOCI). He is the technical lead for ImageJ2, the next-generation version of ImageJ, and is actively involved with the ImageJ, Fiji and Open Microscopy Environment (OME) software communities. In 2005 he started the Bio-Formats project to address the growing number of proprietary microscopy file formats. Before that, Curtis was also one of the principal programmers on the VisAD Java component library for interactive and collaborative visualization and analysis of numerical data, developed at the UW's Space Science and Engineering Center. He has an M.S. in Computer Sciences from the University of Wisconsin-Madison.