

## ImgLib2—Concepts and Features

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### Abstract

ImgLib2 is an open-source library for representing and manipulating image data. It is the core data model underlying ImageJ2. ImgLib2 aims at minimizing code duplication by being agnostic to the image data type, dimensionality, and storage format.

The prominent feature of ImgLib2 is an interface architecture that clearly separates pixel-algebra, data access, and data representation in memory. On the one hand, the interface hierarchy provides fine-grained control in specifying the requirements of image processing algorithms to facilitate maximum re-usability. On the other hand, it provides great flexibility to developers when adding new image data types and representation. ImgLib2 illustrates that an elegant high-level programming interface can be achieved without sacrificing performance. It provides highly efficient implementations of common data types, storage models, and generic algorithms.

In this demonstration I will showcase ImgLib2 using small example programs. The demonstration consists of several short independent parts, where each part gives a hands-on introduction into one of the features of ImgLib2. Small example codes are developed step-by-step, visualising and explaining intermediate results.

The demonstration highlights type and dimensionality independence, on-the-fly value and coordinate transforms, as well as representation and access to sparse data sets.

### Keywords

ImgLib2, image representation, image processing, generic algorithms

