Icy–An Open-Source Community Image Processing Software

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Abstract

We present Icy (http://icy.bioimageanalysis.org), a GNU GPL open source software providing an integrated and innovative multi-platform development environment for image analysis applications. It offers a common platform both for image analysis scientists developing new algorithms and biologists seeking for a powerful and intuitive tool for image analysis applications. Icy includes a flexible framework designed around a plugin architecture, offers rich data structures for images and output data, enhanced data visualization and communication layers. Icy kernel has been designed to manage multidimensional images as a 5D structure able to store data in 3D, time, and an unlimited number of channels. Icy provides a rich API of 80 functions to perform pixel transfer, conversions and assignments that are designed to access directly the data and are compatible with the native Java objects, ensuring fast transfers and visualizations. A number of functionalities are delegated to dedicated libraries: 3D rendering is done by VTK, loading and saving files by BioFormats, live acquisition by microManager, while Substance and Flamingo are used for interface look and feel and ribbon management. Icy now features more than 100 applicative plugins covering such diverse tasks as image enhancement, filtering, active contours, cell segmentation and tracking, particle detection and tracking, available on the web site and ready for use in biological applications.

Biography

Jean-Christophe Olivo-Marin is the head of the Quantitative Image Analysis Unit and the Chair of the Cell Biology and Infection Department at Institut Pasteur, Paris. He holds a Ph.D. and an HDR in Optics and Signal Processing from IOTA, University of Paris-Orsay. His research interests are in cell and particle tracking, cellular dynamics and computational microscopy. He is an IEEE Fellow, the Past Chair of the Bio Imaging and Signal Processing Technical Committee (BISP-TC) and member of the Editorial Board of Medical Image Analysis and BMC Bioinformatics. He was the General Chair of IEEE ISBI'08 and has organized several special sessions dedicated to biological imaging at international biomedical conferences (ELMI'02, ISBI'04, ICASSP'06, SPIE Wavelets'09 & '11, EMBO'11).