

EDAM Bioimaging

Enabling findability and provenance of image data and image analysis tools

Adriaan-Alexander Ludl^{1✉}, Laure Plantard², Joakim Lindblad³, Martin Jones⁴, Melanie Christine Föll⁵, Magnus Palmblad⁶, Ove Johan Ragnar Gustafsson⁷, Núria Queralt Rosinach⁶, Claire Rioualen⁸, Moritz Kirschmann^{9*}, Anatole Chessel¹⁰, Leandro Scholz^{11*}, Fabienne Rössler^{9*}, Laura Nicolás Sáenz^{12*}, Estibaliz Gómez de Mariscal^{12*}, John Bogovic¹³, Alexandre Dufour^{14*}, Rohola Hosseini¹⁵, Xavier Heiligenstein^{16*}, Dominic Waithe¹⁷, Marie-Charlotte Domart⁴, Matthia Winter-Karremen¹⁸, Raf Van de Plas¹⁹, Robert Haase^{20*}, David Hörl²¹, Lassi Paavolainen²², Paula Sampaio²³, Dean Karaica^{24*}, Ivana Vrhovac Madunić²⁴, Arrate Muñoz-Barrutia¹², Daniel Sage²⁵, Sebastian Munck²⁶, Ofra Golani²⁷, Jon Ison^{8*}, Josh Moore²⁸, Florian Levet²⁹, Alban Gaignard³⁰, Hervé Ménager¹⁴, Nataša Sladoje³, Chong Zhang³¹, Kota Miura³², Julien Colombelli³³, Perrine Paul-Gilloteaux³⁰, and Matúš Kalaš¹. **We are welcoming new contributors!**

Department of Informatics, University of Bergen, Norway; & ELIXIR Norway; ²Friedrich Miescher Institute for Biomedical Research, Basel, Switzerland; ³Centre for Image Analysis, Uppsala University, Sweden; ⁴Francis Crick Institute, London, UK; ⁵University of Freiburg, Germany; ⁶Leiden University Medical Center, Netherlands; ⁷Australian BioCommons, & University of Melbourne, Australia; ⁸French Institute of Bioinformatics (IFB), ELIXIR France; ⁹Center for Microscopy and Image Analysis, University of Zürich, Switzerland; ¹⁰École Polytechnique, Palaiseau, France; ¹¹Federal University of Paraná, Curitiba, Brazil; ¹²Universidad Carlos III de Madrid, Spain; ¹³Janelia Research Campus, Ashburn, VA, USA; ¹⁴Institut Pasteur, Paris, France; ¹⁵Leiden University, Netherlands; ¹⁶Institut Curie, Paris, France; ¹⁷University of Oxford, UK; ¹⁸Deutsches Krebsforschungszentrum, Heidelberg, Germany; ¹⁹Delft University of Technology, Netherlands; ²⁰Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany; ²¹Ludwig-Maximilians-University of Munich, Germany; ²²FIMM, University of Helsinki, Finland; ²³University of Porto, Portugal; ²⁴Institute for Medical Research and Occupational Health, Zagreb, Croatia; ²⁵École Polytechnique Fédérale de Lausanne, Switzerland; ²⁶VIB, & KU Leuven, Belgium; ²⁷Weizmann Institute, Rehovot, Israel; ²⁸OME, & German Bioimaging, Germany; ²⁹University of Bordeaux, France; ³⁰L'institute du thorax, Nantes, France; ³¹University Pompeu Fabra, Barcelona, Spain; ³²Nikon Imaging Center, University of Heidelberg, Germany; ³³Advanced Digital Microscopy core facility, Institute for Research in Biomedicine, Barcelona, Spain.

*at the time of contribution

✉ adriaan.ludl@uib.no



[/edamontology/edam-bioimaging](https://github.com/edamontology/edam-bioimaging)


This poster can be downloaded from <http://edamontology.org/poster-bioimaging.pdf>



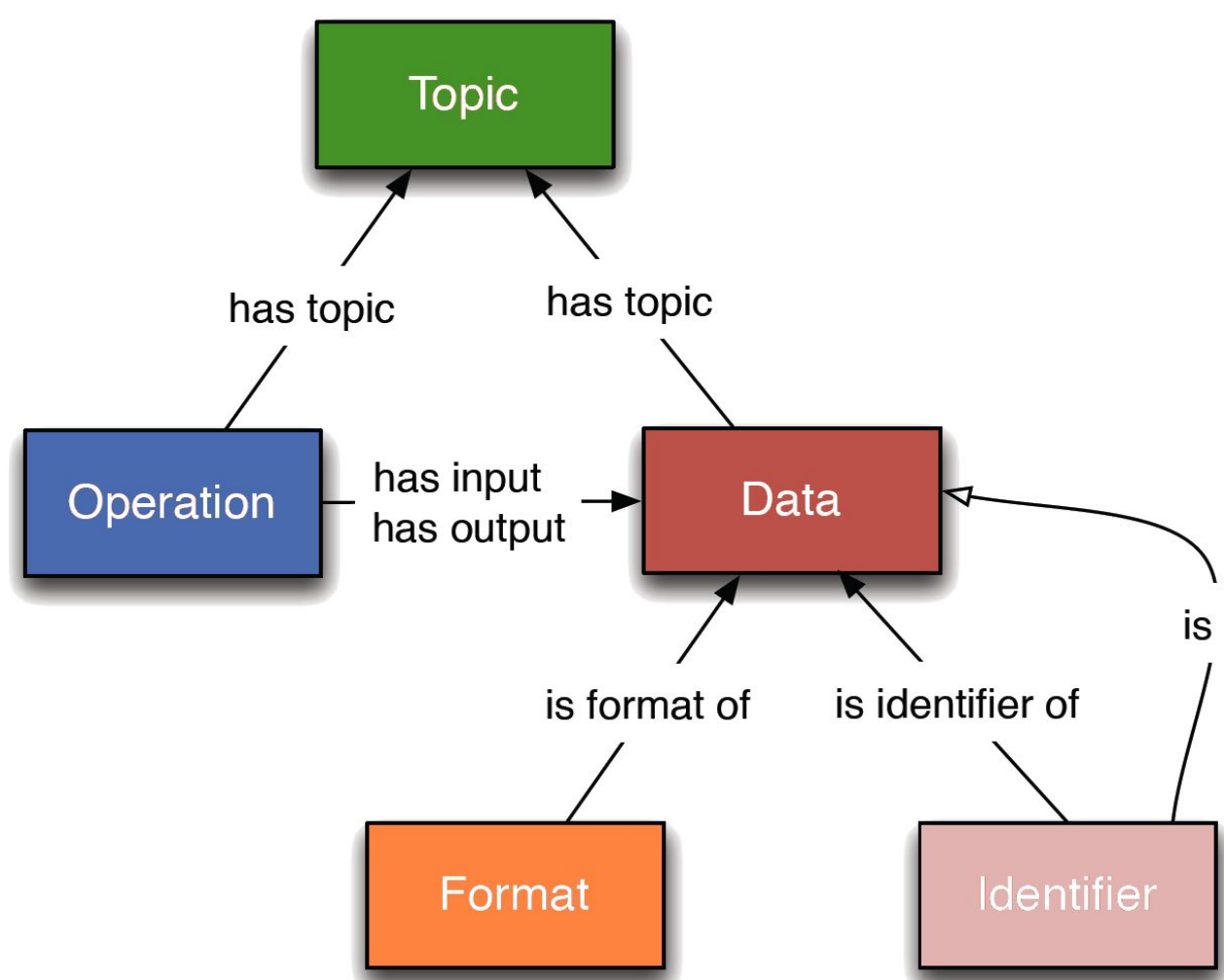
What? EDAM Bioimaging is an extension of the [EDAM ontology](#), dedicated to bioimaging, image analysis, image processing, and bioimage informatics.

Why? EDAM Bioimaging fosters open science by enabling interoperable descriptions of software, data, publications, workflows, and training materials.

How? EDAM Bioimaging is developed in an open community spirit, in a welcoming collaboration between imaging experts, scientists, and engineers.

How can I contribute? EDAM needs your expertise! Please help by posting comments with suggestions or needs for clarification (here ) , creating GitHub issues or pull requests, or if possible participating in some hackathon. Please see <https://github.com/edamontology/edam-bioimaging#contributing>.

STRUCTURE OF EDAM



EXAMPLE CONCEPTS

Preferred Name	Correlative light and electron microscopy
Definition	Correlative light and electron microscopy is the combination of light microscopy (typically fluorescence microscopy) and electron microscopy of the same sample.
hasExactSynonym	CLEM Correlative light-electron microscopy
hasNarrowSynonym	Integrated light and electron microscopy (ILEM) Integrated light-electron microscopy
seeAlso	https://en.wikipedia.org/wiki/Correlative_light-electron_microscopy
subClassOf	Light microscopy Electron microscopy Multimodal imaging

Preferred Name	Filament tracing
Definition	Filament tracing operations are image analysis operations in which there is an image of a filamentous structure (it may be a tree-like structure, a filament network or an agglomeration of single 'stick-like' filaments) as input and outputs data that represent the filament, most commonly a skeleton representation of the filaments and their diameters or surfaces.
hasExactSynonym	Tubular structure extraction
hasNarrowSynonym	Biofilament tracing
hasRelatedSynonym	Curvilinear structure reconstruction Curvilinear structure detection
Related term	Neuron reconstruction
seeAlso	Neuron image analysis
subClassOf	Image segmentation

EDAM Bioimaging is used in [Biii.eu](#), the registry of bioimage analysis tools, workflows, and training materials

HOMEFORUMSABOUT BISEADVANCED SEARCHHOW TO CURATETAGGERS

Filament tracing

Fulltext search

EDAM BIOIMAGING ONTOLOGY

+

Data

+

Format

+

Operation

>

Alignment construction

>

Analysis

>

Image analysis

>

Colocalisation analysis

>

Filament tracing

>

Image feature detection

>

Neuron image analysis

>

Object counting

>

Object detection

>

Object feature extraction

>

Object tracking

>

Optical flow

Paintera

Component

Description

Paintera is a general visualization tool for 3D volumetric data and proof-reading in segmentation/reconstruction with a primary focus on neuron reconstruction from electron micrographs in connectomics. It features/supports:

•

Views of orthogonal 2D cross-sections of the data at arbitrary angles and zoom levels

•

Mipmaps for efficient display of arbitrarily large data at arbitrary scale levels

•

Label data

◦

Painting

◦

Manual agglomeration

◦

3D visualization as polygon meshes

•

Meshes for each mipmap level

•

Mesh generation on-the-fly via marching cubes to incorporate painted labels and agglomerations in 3D visualization. Marching Cubes is parallelized over small blocks. Only relevant blocks are considered (huge speed-up for sparse label data).

Paintera is implemented in Java and makes extensive use of the UI framework JavaFX

has topic

Electron microscopy

has function

In-silico reconstruction

has function

Filament tracing

has function

Image reconstruction

has function

Image visualisation

has function

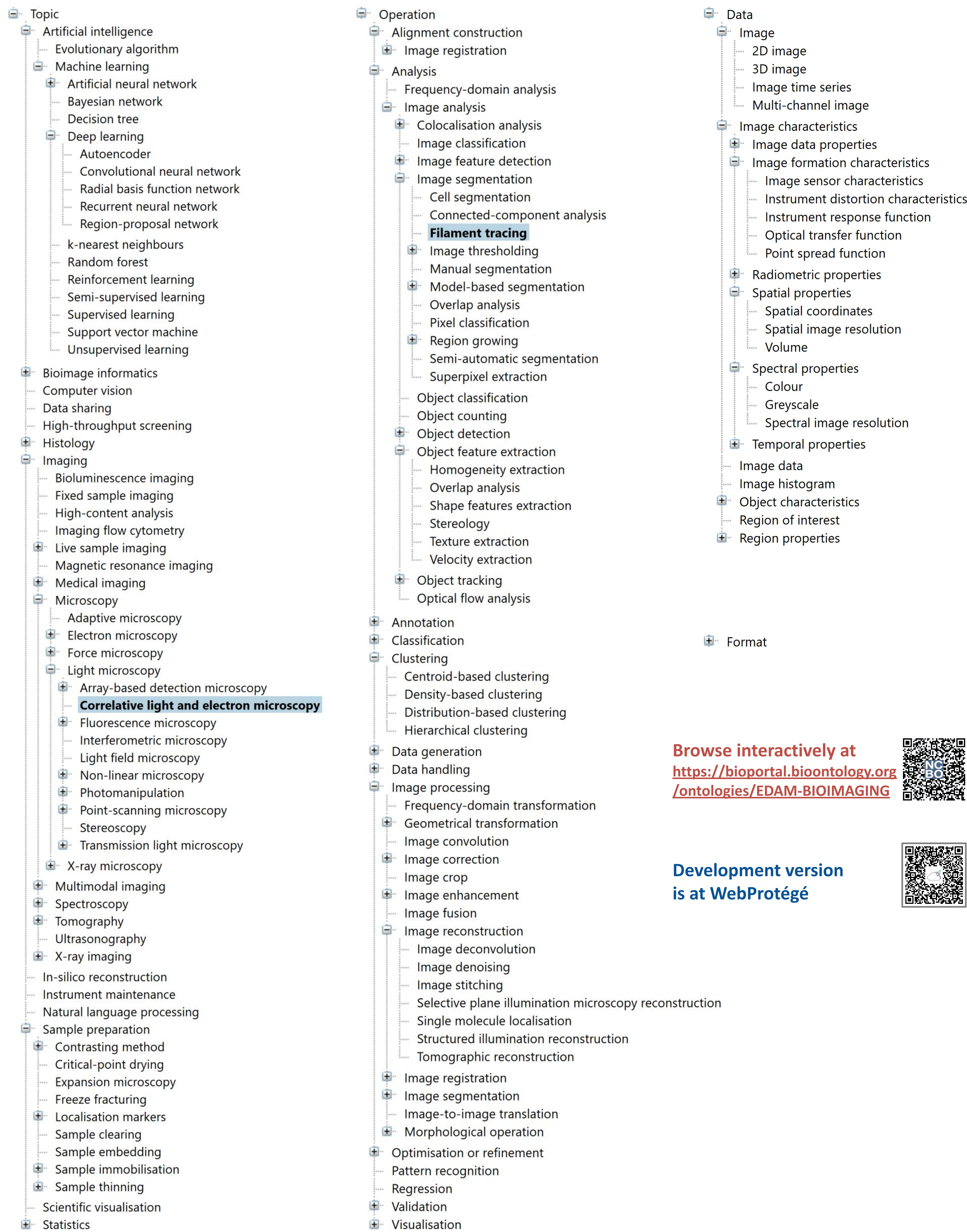
Slice rendering

has function

Surface rendering

... and in REMBI, the standard for bioimage metadata

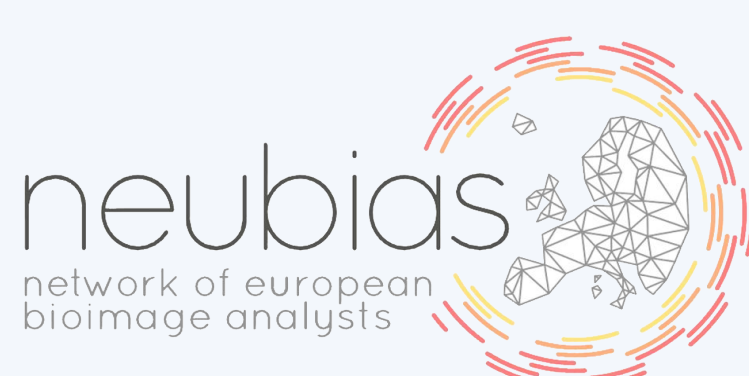
HIERARCHIES OF EDAM Bioimaging



Browse interactively at <https://bioportal.bioontology.org/ontologies/EDAM-BIOIMAGING>

Development version is at WebProtégé

Developed with support from:



In coordination with:

