EDAM-bioimaging

The ontology of bioimage informatics operations, topics, data, and formats

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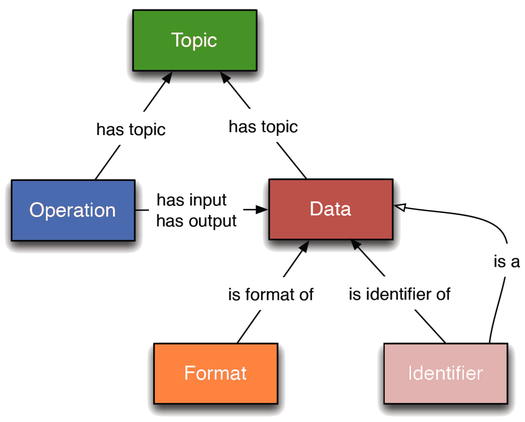
What? EDAM-bioimaging is an extension of the EDAM ontology, dedicated to bioimage analysis, bioimage informatics, and bioimaging.

Why? EDAM-bioimaging enables interoperable descriptions of software, publications, data, workflows, and training, fostering open science.

How? EDAM-bioimaging is developed in a community spirit, in a welcoming collaboration between numerous bioimaging experts and ontology developers.

How can I contribute? We need your expertise! You can help by posting comments with suggestions or needs for clarification, creating GitHub issues or pull requests, or if possible participating in a Taggathon or another 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 microsco (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 a 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

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HIERARCHIES OF EDAM-bioimaging

- Topic
  - Artificial intelligence
    - Evolutionary algorithm
    - Machine learning
      - Artificial neural network
      - Bayesian network
      - Decision tree
      - Deep learning
        - Autoencoder
        - Convolutional neural network
        - Radial basis function network
        - Recurrent neural network
        - Region-proposal network
      - k-nearest neighbours
      - Random forest
      - Reinforcement learning
      - Semi-supervised learning
      - Supervised learning
      - Support vector machine
      - Unsupervised learning
  - Bioimage informatics
  - Computer vision
  - Data sharing
  - High-throughput screening
  - Histology
  - Imaging
    - Bioluminescence imaging
    - Fixed sample imaging
    - High-content analysis
    - Imaging flow cytometry
    - Live sample imaging
    - Magnetic resonance imaging
    - Medical imaging
    - Microscopy
      - Adaptive microscopy
      - Electron microscopy
      - Force microscopy
      - Light microscopy
        - Array-based detection microscopy
        - **Correlative light and electron microscopy**
        - Fluorescence microscopy
        - Interferometric microscopy
        - Light field microscopy
        - Non-linear microscopy
        - Photomanipulation
        - Point-scanning microscopy
        - Stereoscopy
        - Transmission light microscopy
      - X-ray microscopy
    - Multimodal imaging
    - Spectroscopy
    - Tomography
    - Ultrasonography
    - X-ray imaging
  - In-silico reconstruction
  - Instrument maintenance
  - Natural language processing
  - Sample preparation
    - Contrasting method
    - Critical-point drying
    - Expansion microscopy
    - Freeze fracturing
    - Localisation markers
    - Sample clearing
    - Sample embedding
    - Sample immobilisation
    - Sample thinning
  - Scientific visualisation
  - Statistics
- Operation
  - Alignment construction
    - Image registration
  - Analysis
    - Frequency-domain analysis
    - Image analysis
      - Colocalisation analysis
      - Image classification
      - Image feature detection
      - Image segmentation
        - Cell segmentation
        - Connected-component analysis
        - **Filament tracing**
        - Image thresholding
        - Manual segmentation
        - Model-based segmentation
        - Overlap analysis
        - Pixel classification
        - Region growing
        - Semi-automatic segmentation
        - Superpixel extraction
      - Object classification
      - Object counting
      - Object detection
      - Object feature extraction
        - Homogeneity extraction
        - Overlap analysis
        - Shape features extraction
        - Stereology
        - Texture extraction
        - Velocity extraction
      - Object tracking
      - Optical flow analysis
  - Annotation
  - Classification
  - Clustering
    - Centroid-based clustering
    - Density-based clustering
    - Distribution-based clustering
    - Hierarchical clustering
  - Data generation
  - Data handling
  - Image processing
    - Frequency-domain transformation
    - Geometrical transformation
    - Image convolution
    - Image correction
    - Image crop
    - Image enhancement
    - Image fusion
    - Image reconstruction
      - Image deconvolution
      - Image denoising
      - Image stitching
      - Selective plane illumination microscopy reconstruction
      - Single molecule localisation
      - Structured illumination reconstruction
      - Tomographic reconstruction
    - Image registration
    - Image segmentation
    - Image-to-image translation
    - Morphological operation
  - Optimisation or refinement
  - Pattern recognition
  - Regression
  - Validation
  - Visualisation
- Data
  - Image
    - 2D image
    - 3D image
    - Image time series
    - Multi-channel image
  - Image characteristics
    - Image data properties
    - Image formation characteristics
      - Image sensor characteristics
      - Instrument distortion characteristics
      - Instrument response function
      - Optical transfer function
      - Point spread function
    - Radiometric properties
    - Spatial properties
      - Spatial coordinates
      - Spatial image resolution
      - Volume
    - Spectral properties
      - Colour
      - Greyscale
      - Spectral image resolution
    - Temporal properties
  - Image data
  - Image histogram
  - Object characteristics
  - Region of interest
  - Region properties
- Format

Browse interactively at https://bioportal.bioontology.org/ontologies/EDAM-BIOIMAGING/?p=classes

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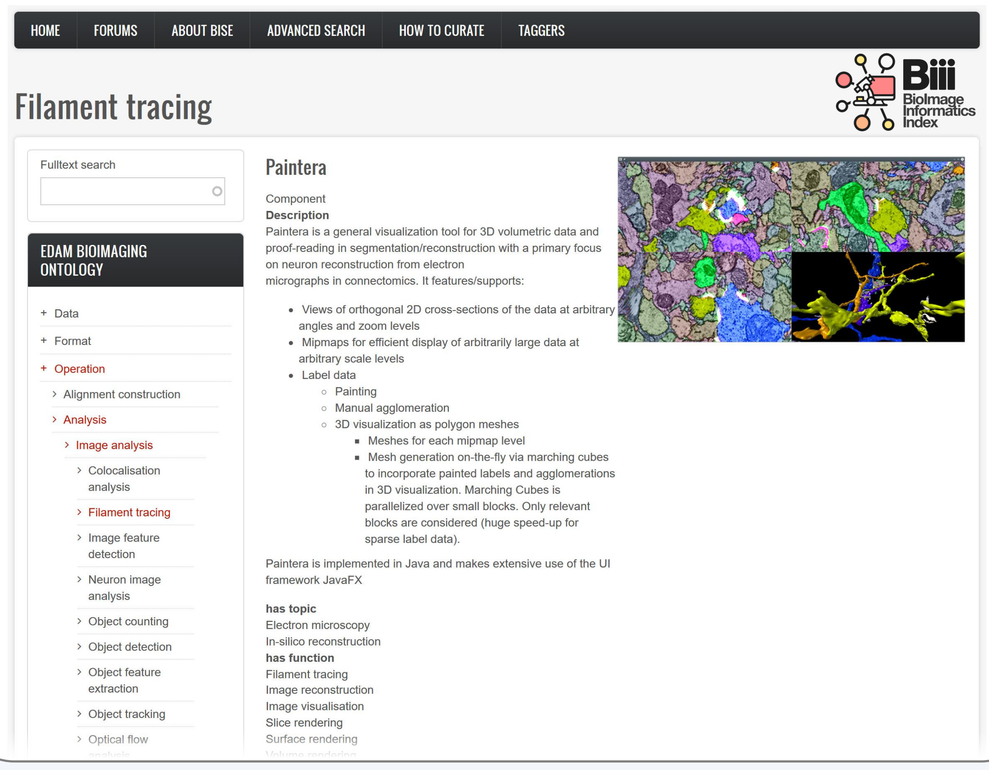
EDAM-bioimaging is used in biii.eu, the registry of bioimage analysis tools, workflows, and training materials



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