Development of A Web-based Volume Browser

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EMD-4134: Cryoelectron Tomographic Analysis of an HIV-neutralizing Protein and Its Complex with Native Viral gp120

Release date: 2014/5/3
DOI: 10.1074/jbc.M702025200
more details...

CSI:3D-1000/07/0123
Volume Slicer

CLIENT SIDE

SERVER SIDE

PDBe API

EMD-xxxx

Metadata

Send Javascript
application

HTTP request
(EMD-xxxx)

OMERO Server

OMERO Web

Render images

HTTP request
(images)

OMERO Staging Server

Sync staging
to production

EMDB map files

Process volumes

IMOD 4.8 Programs

Full-scale and thumbnail volumes

Weekly process

EMD-6422 · Volume slicer

CryoEM structure of GroEL

Sample name:
Wild type GroEL

Method:
Single-particle

Resolution:
4.1Å (FSC 0.143, gold-standard)
Segmentations and EMDB-SFF

• EMDB-SFF: 3D Segmentations and Transformations Workshop (December 2015)

• Representing segments:
  • 3D Volume (Voxels)
  • Contours (Polygons/Polylines)
  • Meshes (Vertices + Polygons)
  • Shape Primitives (Ellipsoid, Cylinder, Cone, Cuboid)

• SFFTK: the go-between app-SFFs, EMDB-SFF and OMERO

Current SFFs:
• Segger (.seg)
• IMOD (.mod)
• Amira HxSurf (.surf)
• Amira Mesh (.am)
OMERO ROIs

EMDB-SFF

3D Volume
Contours
Meshes
Shape primitives

SFFTK

Generate ROIs
as polygons/
polylines in X, Y
and Z

VTK

Construct 3D model
and perform slicing to
generate orthogonal
contours

ROIs

One-to-one
representation
with OMERO
ROIs

SFFTK

Associate ROIs
with image data

OMERO

PDBe
Examples
Support/Feature Requests

- OMERO and Bio-Formats are awesome!
  - Clear design outline and data models
  - Very responsive developer community

- Developer requests:
  - Documentation of Python API (a bit hard to use without description of objects)
  - Adapter for Python API (I have an example for ROIs that makes ROI primitives more Pythonic) – only has to be done once! ;-) 
  - Bio-Formats: extending Amira readers to get header metadata
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