XROMM AutoScoper

The XROMM AutoScoper application is designed to aid in the markerless tracking of bone movements from biplanar X-ray video sequences. It has been developed as part of the XROMM project at Brown University.

UNDER CONSTRUCTION

New Versions (Beta)

We are releasing autoscoper in a new Version. Up to know we only applied minor changes and bugfixes, but we will continue development with this version. You can find the first beta release of the new UI here.

Mac Version (OpenCL)

Windows Version (OpenCL)

Windows Version (Cuda)

Old Versions:

For Windows, download the AutoScoper 1.13 install package and follow Installation Instructions. You must have an NVIDIA graphics card and the newest NVIDIA drivers.

For Mac OSX Download the XROMM AutoScoper Version rc2. The OSX version requires X11 or XQuartz and does not run on all Apple computers. **Warning:** this version has not been tested in a research environment. Use v1.13 under Windows with NVIDIA GPU for best results.

Download the Autoscoper Source Code for Windows/NVIDIA for v1.13 from here. Download Autoscoper Source Code for Mac OS v. 1.14rc from bitbucket. AutoScoper is Open Source under a 3-clause BSD license.

- Join the XROMM AutoScoper User Group to ask questions and share information with other users.
- An upper extremity (radius, ulna and 3rd metacarpal) example data set and tutorial instructions are available. Download .zip folder (1.28 GB). Thanks to Professor J.J. Crisco, Tarpit Patel and Raza Husain for preparing and sharing this tutorial.

No other documentation or support, other than this wiki, is available at this time.

To track bones with AutoScoper, the following files and information are needed:

mayaCam.csv

Each camera must have an associated MayaCam.csv file. This file specifies the camera's position and orientation as well as the dimensions and location of the imaging plane in laboratory space. This file is created when DLT coefficients are calculated using XrayProject.

Undistorted Video Frames

A folder of undistorted tif images for each camera (no jpg!). To undistort video sequences, click Undistort Video in the XrayProject window or use the XROMM Undistorter.

BoneModel.tif

Each bone in the trial must have a corresponding .tif model consisting of a sequence of images that represents the slices collected by the CT. Use ROIs (regions of interest) or the scissor tool in Amira or OsiriX to extract the bone of interest. Export the image sequence from Osirix or Amira as tif files. Use ImageJ to create a single .tif file containing only the bone of interest. Usually, the resulting bone model is mirrored along the z-Axis when viewed in autoscoper. Use Volume flip (0 0 1) when creating your trial to correct this.

Danny Miranda developed an OsiriX Workflow for creating bone.tif files from CT scans. (OsiriX is a free DICOM reader for Mac OS only).

Gulshan Sharma, PhD, University of Calgary developed an Amira Workflow for creating a volumetric bone models from MRI scans (Download MRI2Autoscoper.pdf).

Bone Dimensions

In addition to the above model, you need to know the size of the voxels in the above volume. This is a function of the in-plane resolution as well as the slice thickness of the CT scan. These values should be specified in millimeters.

Creating trials
Requirements and Installation
Application layout

Tracking (new page)