

Lung Anatomy + Particle Deposition (lapd) Mouse Archive for Modeling and Computational Toxicology

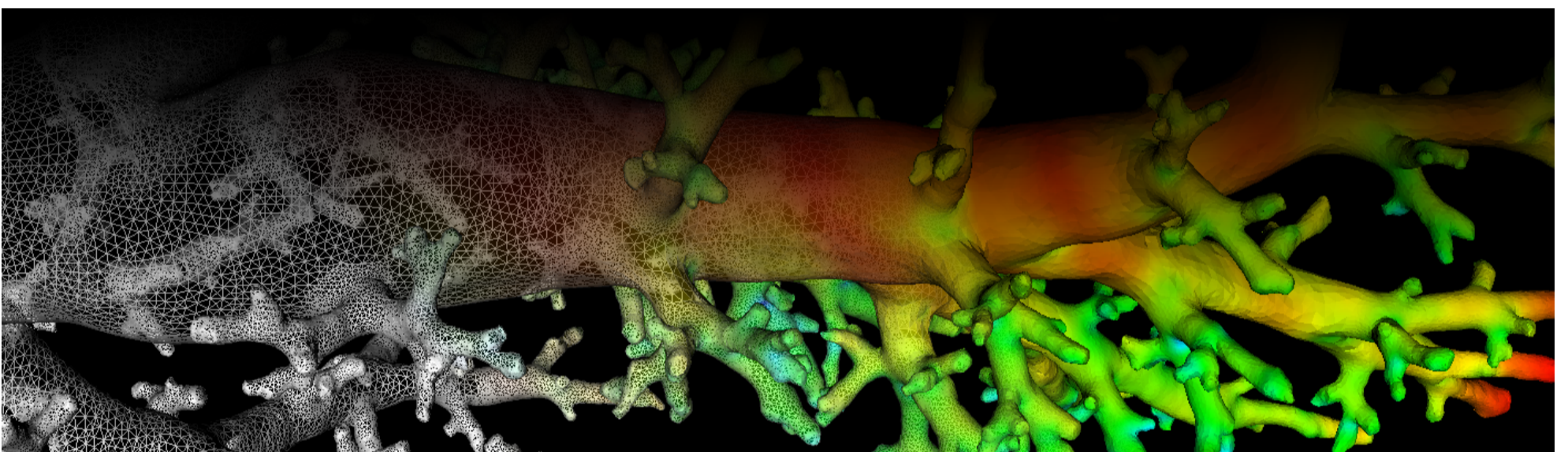


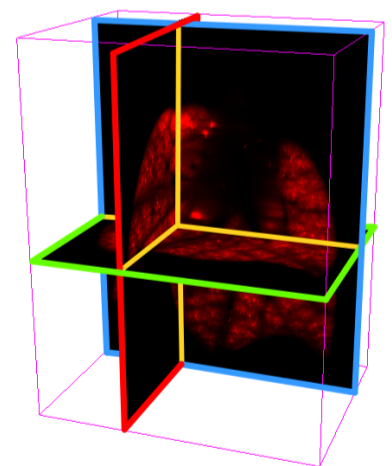
Image volume *_Aerosol*.mha

Aerosol deposition image volume (prior to deconvolution).

Color channel of the imaging cryomicrotome showing aerosol deposition ([Fig. 1](#)). The full resolution image *_Aerosol.mha as well as versions downsampled by by factor 2 and 4 in each dimension are stored in files *_AerosolSub2.mha and *_AerosolSub4.mha, respectively.

Starting with the [*_RawCryomicotomeData](#), the individual aerosol channel image slices are converted, assembled into an image volume, artifacts are removed, and the volume is cropped to the field of view containing only the lung and trachea.

This aerosol deposition image volume is further processed: (a) to increase the resolution of particle measurements deconvolution is applied resulting in [*_AerosolDeconv*.mha](#) and (b) to allow better comparison of aerosol deposition between mice the voxel values are normalized resulting in [*_AerosolNormalized*.mha](#).



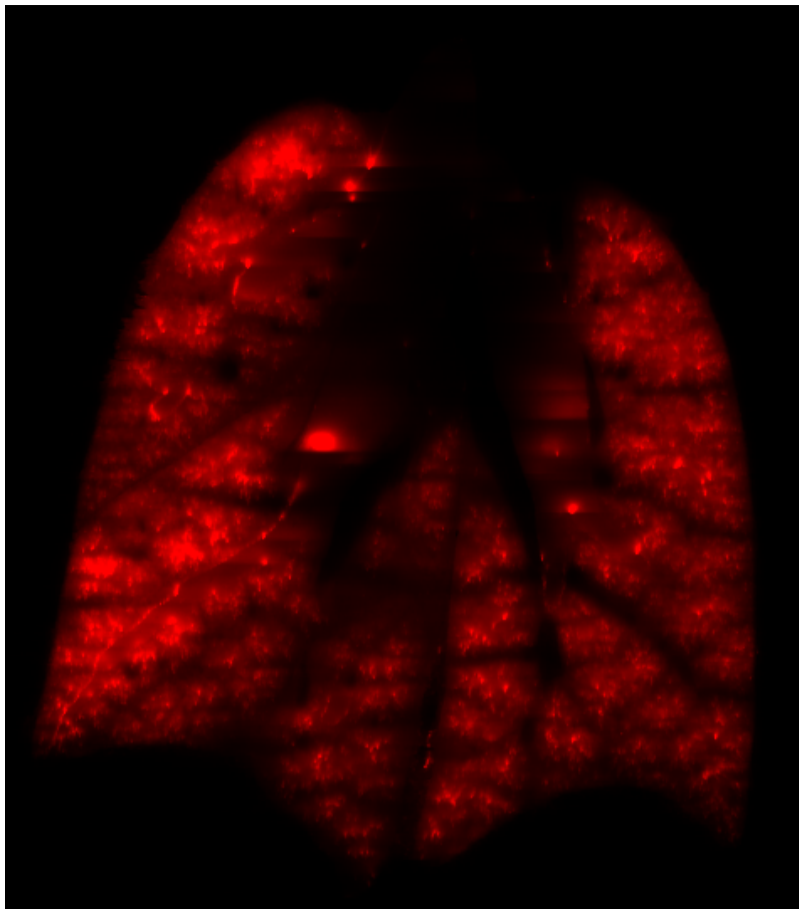


Fig. 1: Coronal image slice of image volume showing aerosol deposition without deconvolution.

The size and resolution of the resulting image volumes `*_Aerosol.mha` vary slightly from mouse to mouse, but the full resolution images have a resolution in the range of $9 \times 9 \times 9 \mu\text{m}$ and size in the range of $2000 \times 2000 \times 2500$ voxels, resulting in an image volume $>20\text{GB}$ per mouse when stored with 32 bit precision per voxel. The size and spacing is identical to their corresponding image volumes [*_AerosolDeconv*.mha](#), [*_AerosolNormalized*.mha](#) and [*_Autofluorescent*.mha](#).

Code Example

This examples shows how to read and write a volumetric image such as `*_Aerosol.mha` using C++ and ITK.

`readWriteImage.cpp` hosted with ❤ by [GitHub](#)

[view raw](#)

```
/*
Example how to read and write intensity images used in lapdMouse project using ITK.

```bash
./readWriteImage m01_AerosolSub2.mha out.mha
```
*/

// ITK includes
#include <itkImage.h>
#include <itkImageFileReader.h>
#include <itkImageFileWriter.h>

int main(int argc, char**argv)
{
    if (argc!=3)
    {
        std ::cerr << "Usage: " << argv[0] << " input output" << std::endl;
        return -1;
    }

    // typedef for volumetric images used in lapdMouse project
    typedef itk ::Image< float, 3 > ImageType;
```

Related Data Structures

[*_RawCryomicotomeData](#) | [*_AerosolDeconv*.mha](#) | [*_AerosolNormalized*.mha](#) | [*_Autofluorescent*.mha](#)

Related Code Examples

[readWriteImage.cpp](#) | [imageLabelStatistics.cpp](#)

Updated: 7/24/19
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