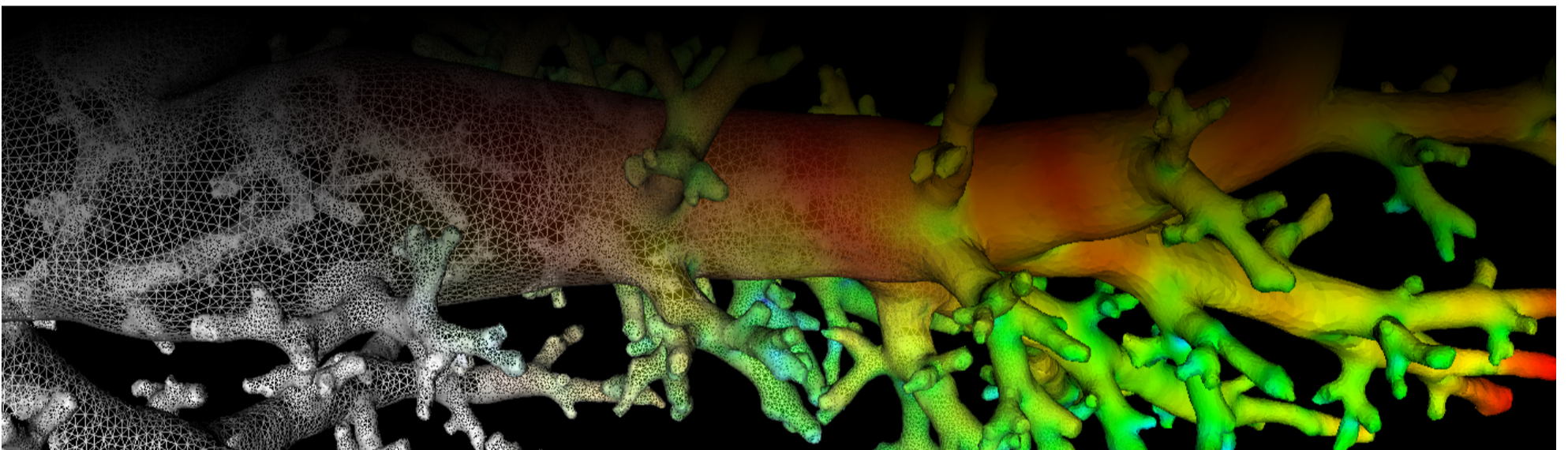


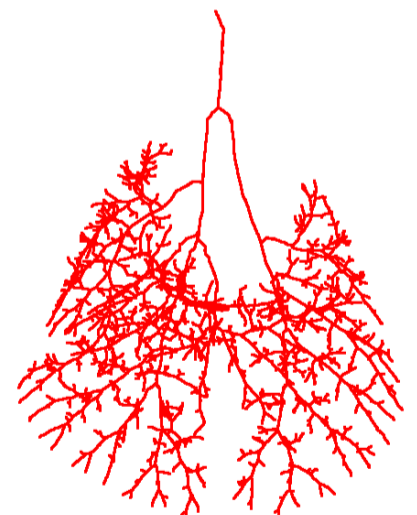
Lung Anatomy + Particle Deposition (lapd) Mouse Archive for Modeling and Computational Toxicology



Structure *_AirwayTree.meta

Airway tree structure based on hierarchically organized airway segment centerlines.

The airway tree is split into airway segments. Each segment is described as an ordered list of centerline points with assigned radii as well as a list of child segments ([Fig. 1](#)). Each segment has a unique ID. The trachea has ID=1.



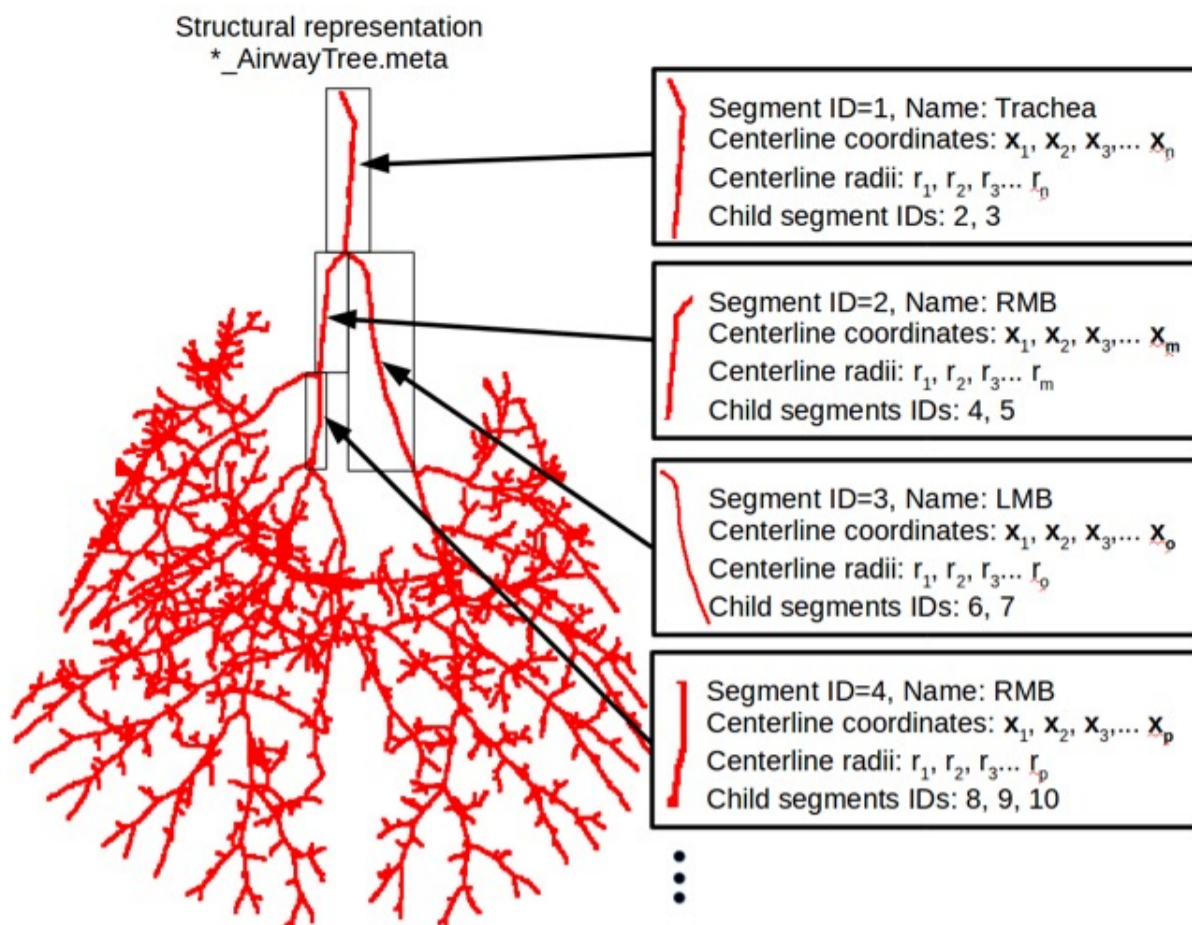


Fig. 1: Structural information stored in *_AirwayTree.meta

The IDs correspond to the IDs utilized to identify airway segments in files [*_AirwayTreeTable.csv](#), [*_AirwaySegments.nrrd](#), and [*_AirwaySegments.vtk](#). See [Airway Tree Label Correspondence](#) for more information. A simplified version of *_AirwayTree.meta where each segment is approximated by a cylindrical element is provided as .csv table [*_AirwayTreeTable.csv](#), which can be easily read with multiple software packages.

Airway segments that are part of main airway branches are assigned names ([Fig. 2](#)): Trachea, left main bronchus (LMB), right main bronchus (RMB), caudal right main bronchus (CaRMB), middle right main bronchus (MiRMB), cranial right main bronchus (CrRMB), and accessory right main bronchus (AcRMB).

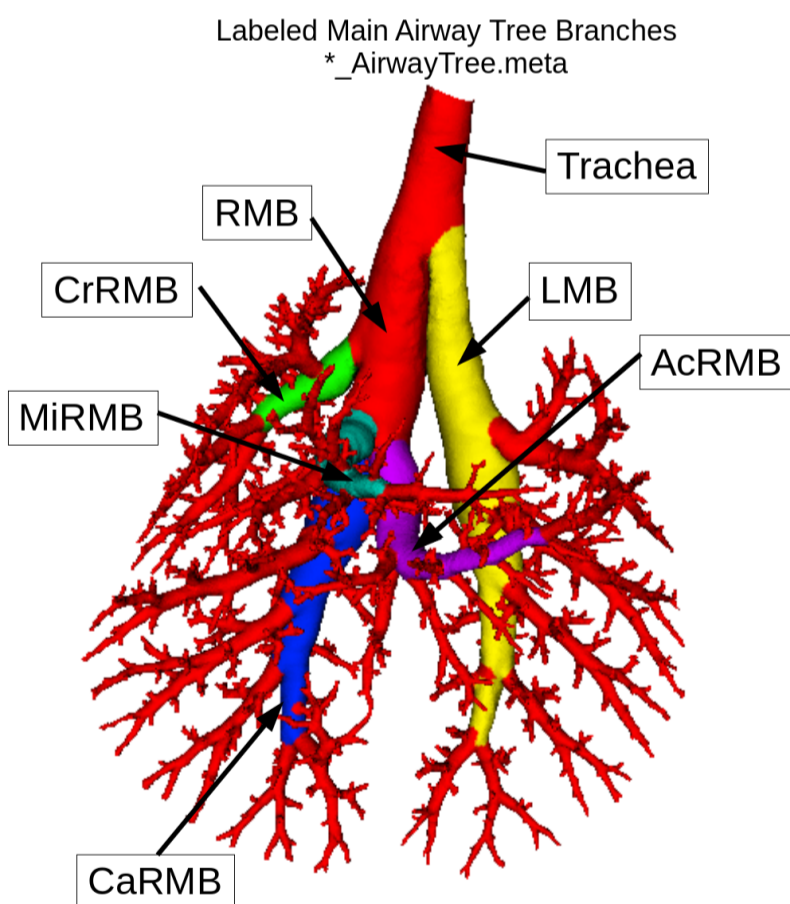


Fig. 2: Major airway branches with assigned names

Code Example

This examples shows how to access information from the tree structure *_AirwayTree.meta using C++ and ITK. It includes how to access segments, find child segments, identify segment names, and iterate over a segment's centerline with their coordinates and radius information.

```
/*
Example how to access data of tree structures used in lapdMouse project using ITK.

```bash
./accessTreeData m01_AirwayTree.meta
```
*/

// ITK includes
#include <itkSpatialObject.h>
#include <itkSpatialObjectReader.h>
#include <itkSpatialObjectWriter.h>

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

    // Tree structures in the lapdMouse project are represented in ITK as a
    // hierarchy of `SpatialObjects`.
```

Related Data Structures

[* AirwayTreeTable.csv](#) | [* AirwaySegments.nrrd](#) | [* AirwaySegments.vtk](#)

Related Code Examples

[accessTreeData.cpp](#) | [simplifyTree.cpp](#) | [metaTree2JsonConverter.cpp](#) | [labelTreePathAndChildren.cpp](#) | [mapOutlet2AirwaySegment.cpp](#) | [partitionLobesIntoTerminalCompartments.cpp](#)

Updated: 7/24/19
2018 r2b