

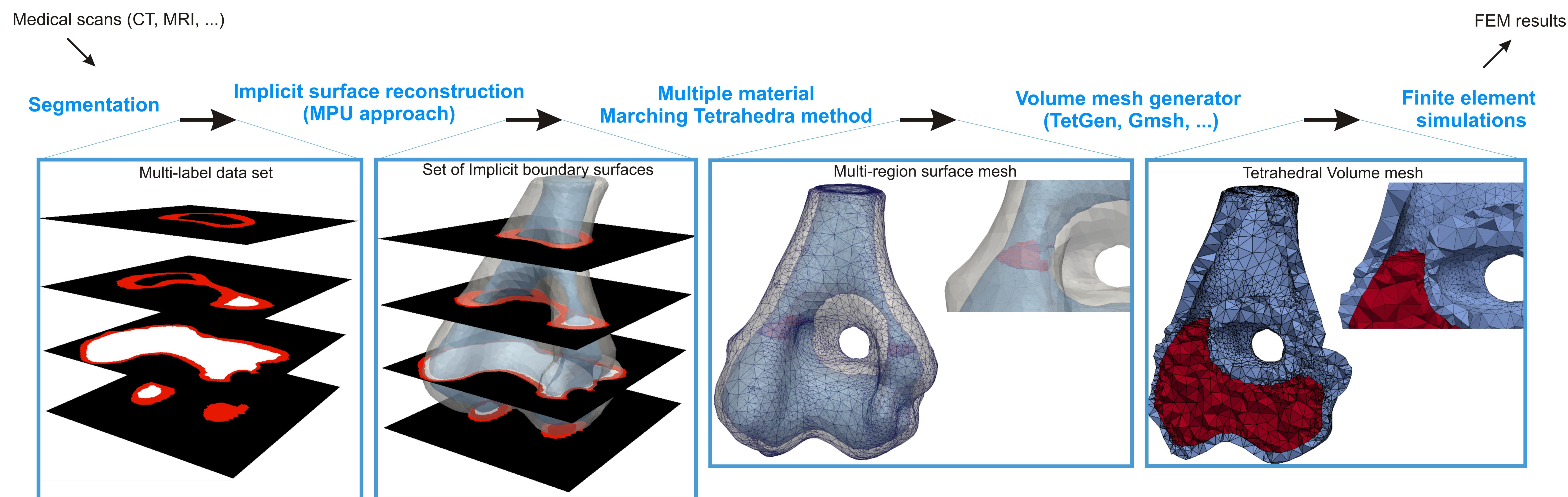
## SUMMARY

The finite element (FE) method is commonly used in biomedical applications for the simulation of the behaviour of biological structures. A key component in FE simulation is the creation of a finite element mesh. In medical applications, the meshes should be directly generated from the medical scans. Moreover, biological structures are usually composed of several inner regions that need to be separately segmented, labelled and meshed to be able to apply different material properties in the finite element model.

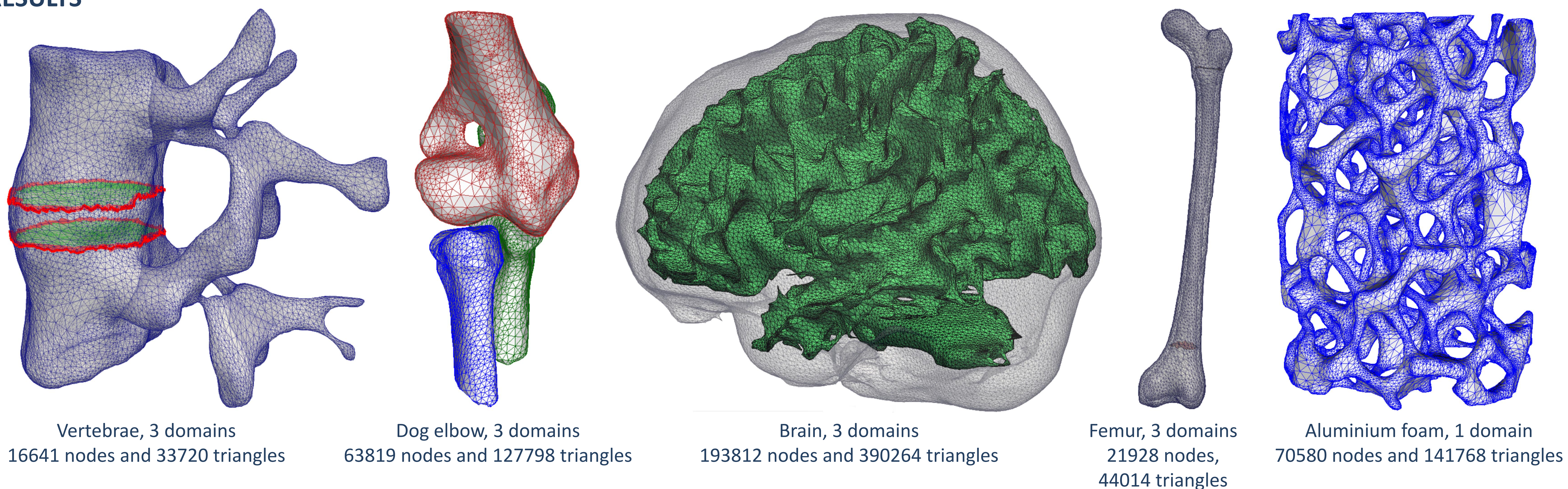
A procedure to create surface meshes from a multi-valued volume data sets is proposed. Following properties are guaranteed:

- The generated mesh consists of a set of non manifold triangle meshes that separate each connected component in the labelled data set. These interface meshes join each other consistently along their boundaries, i.e., no T junctions nor gaps may appear.
- The surface mesh is a geometrically accurate representation of the data represented in the medical scans. However, it is not be tainted by the typical aliasing and staircase artifacts that are due to the discrete nature of the voxels.

## APPROACH OVERVIEW

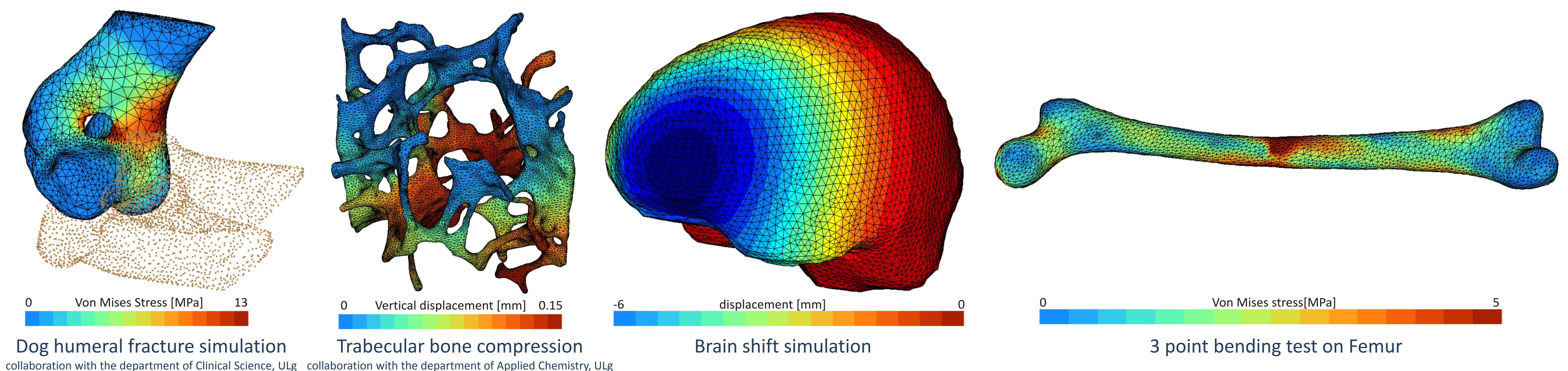


## RESULTS



## APPLICATIONS

Simulations are performed in our home-made FEM code Metafor. 1].



## References

- [1] Metafor, finite element software, <http://metafor.ltas.ulg.ac.be>