

Image-Based Modeling: From Image to Cardiac Digital Twins

Computational Electrophysiology Group

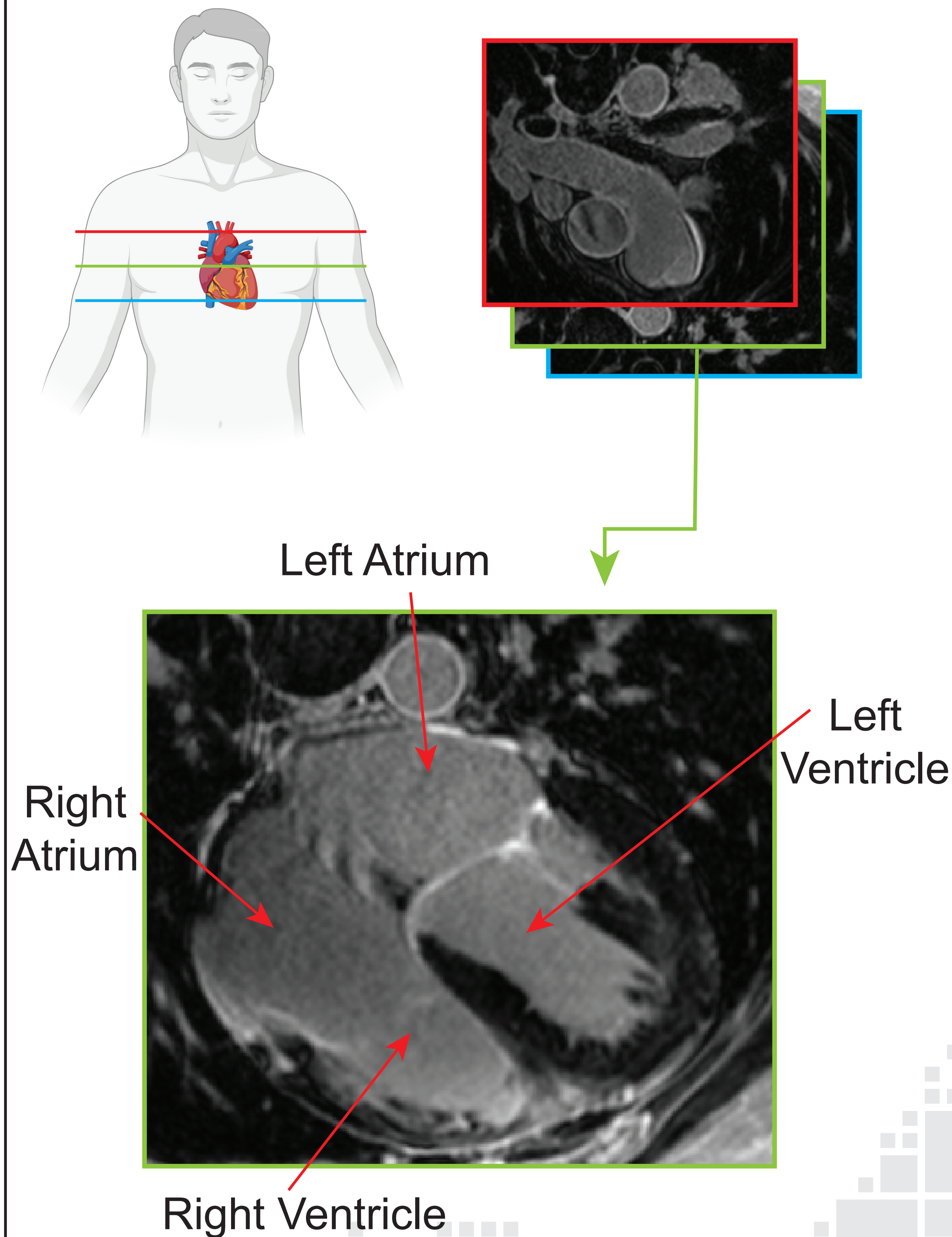
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In the CEG, one of our main areas of focus is computational modeling of the heart. These models are generated through a noninvasive pipeline, using techniques in imaging, segmentation, and computational geometry. Through this pipeline, we are able to generate patient-specific computational models, also known as cardiac digital twins.

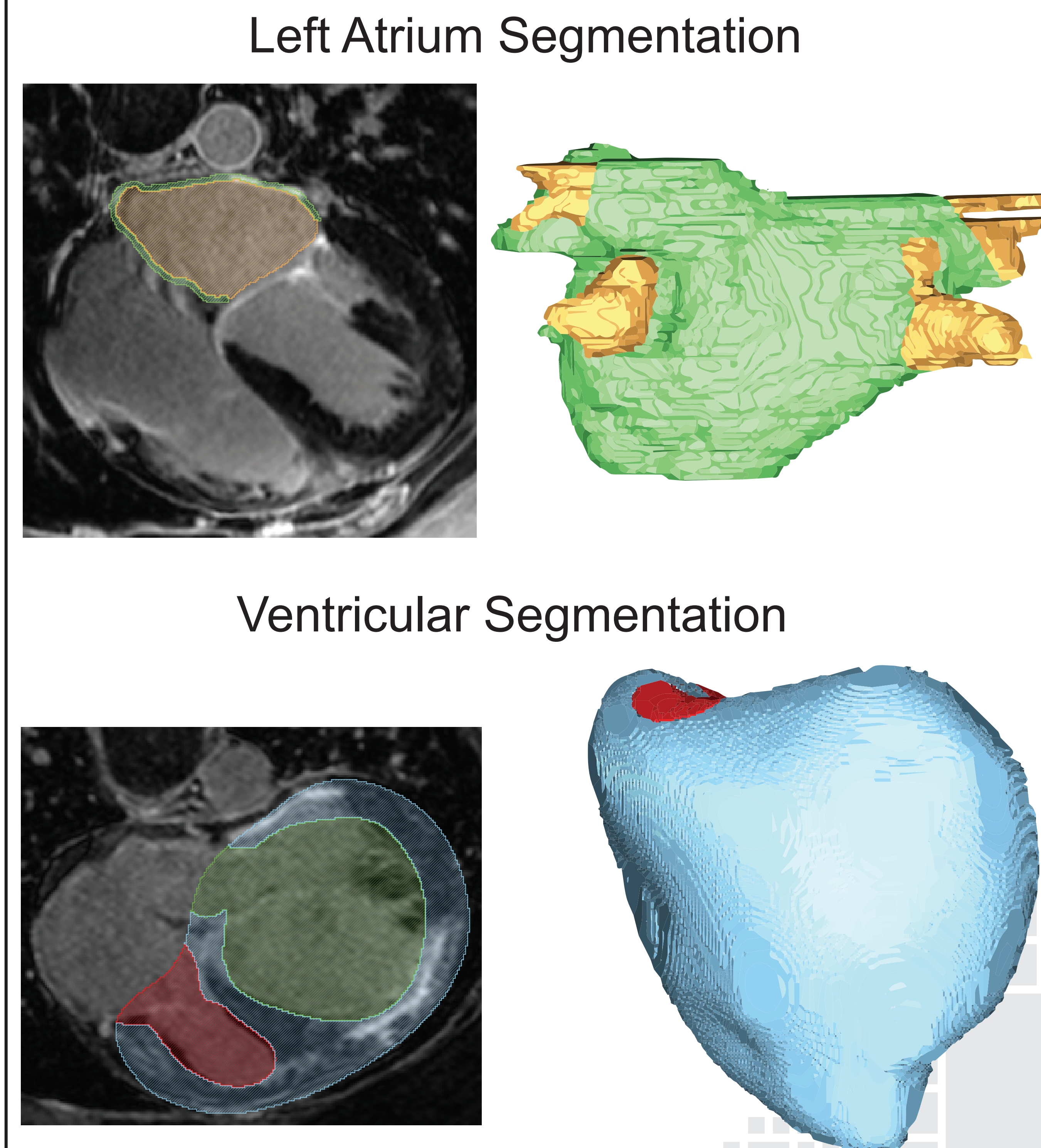
Imaging

Magnetic Resonance Imaging (MRI) or Computed Tomography (CT) images throughout the volume of the heart are acquired.



Segmentation

The region(s) of interest are annotated on each image through the MRI or CT volume. This annotation forms the heart's 3D geometry.



We use a combination of manual and automated methods developed here at SCI to segment the regions of interest.

Model Generation

The 3D segmentation is used to generate a triangular or tetrahedral mesh. Then fibers are assigned to the mesh.

