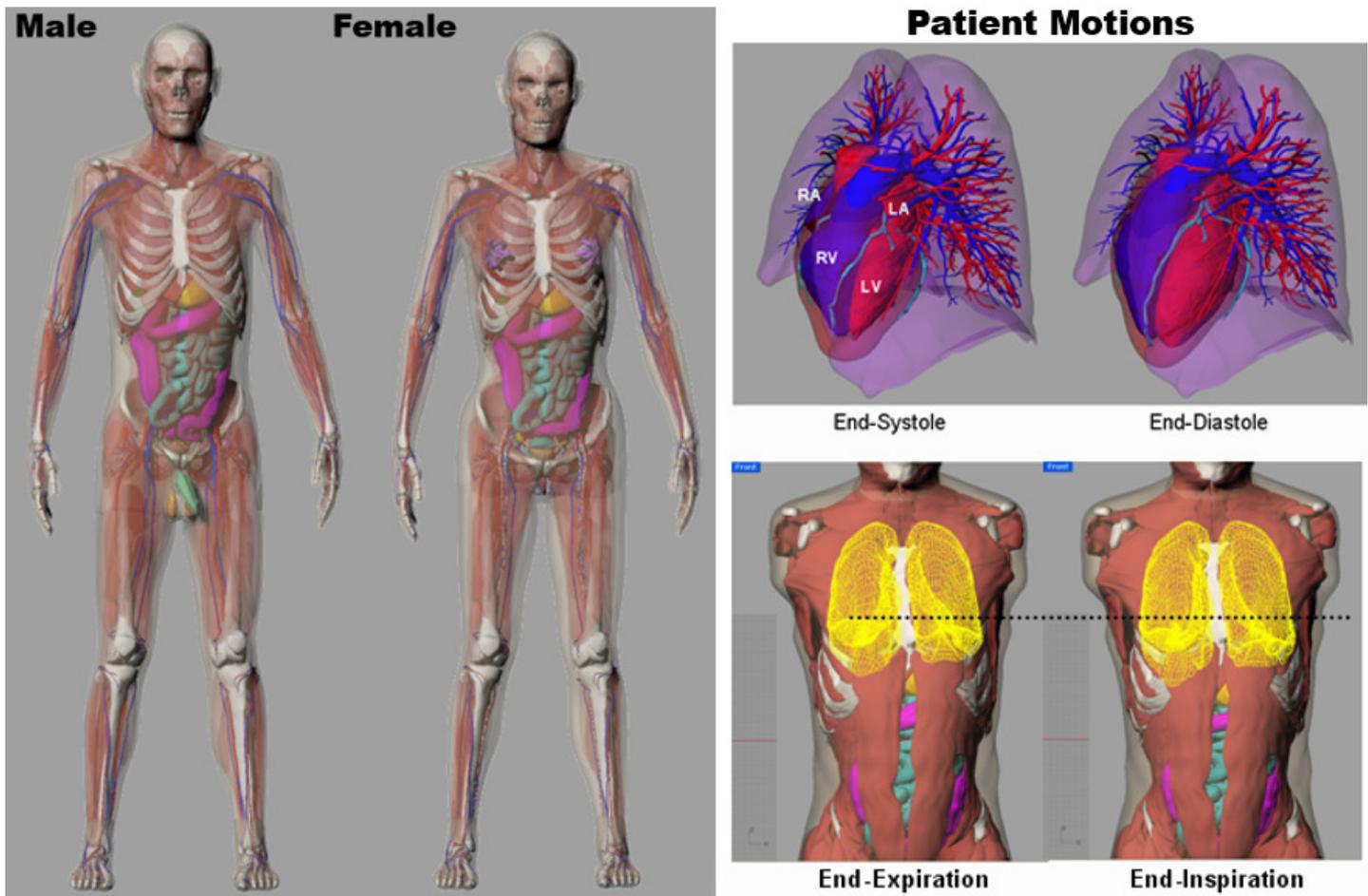


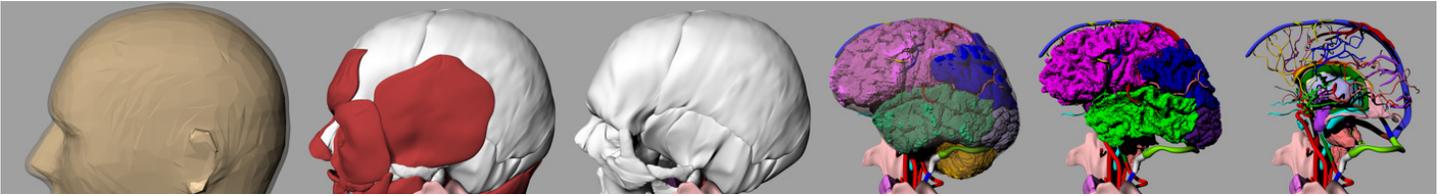
(3434) 4D Extended Cardiac-Torso (XCAT) Phantom Version 2.0

The 4D XCAT phantom was developed to provide virtual patients for medical imaging research. The XCAT software includes a pair of highly detailed male and female anatomies for subjects that are 50th percentile in terms of height/weight and organ volumes. Each anatomy is defined using non-uniform rational b-splines (NURBS) and includes thousands of defined structures as well as parameterized models for the beating heart and respiratory motions. Users can define numerous parameters to create normal and abnormal anatomical and motion variations to simulate a patient population for research. The program includes several functions that work with the phantoms: (1) a main phantom function to create voxelized versions of the phantoms, (2) a cardiac defect function to model regional motion defects as well as perfusion defects, (3) a cardiac plaque function to model plaques in the coronary vessels, lesion function to model spherical lesions in the body, (4) an anatomy altering function to create anatomical variations from the template male and female anatomies, and (5) a vectors function to output motion vectors from the phantoms.



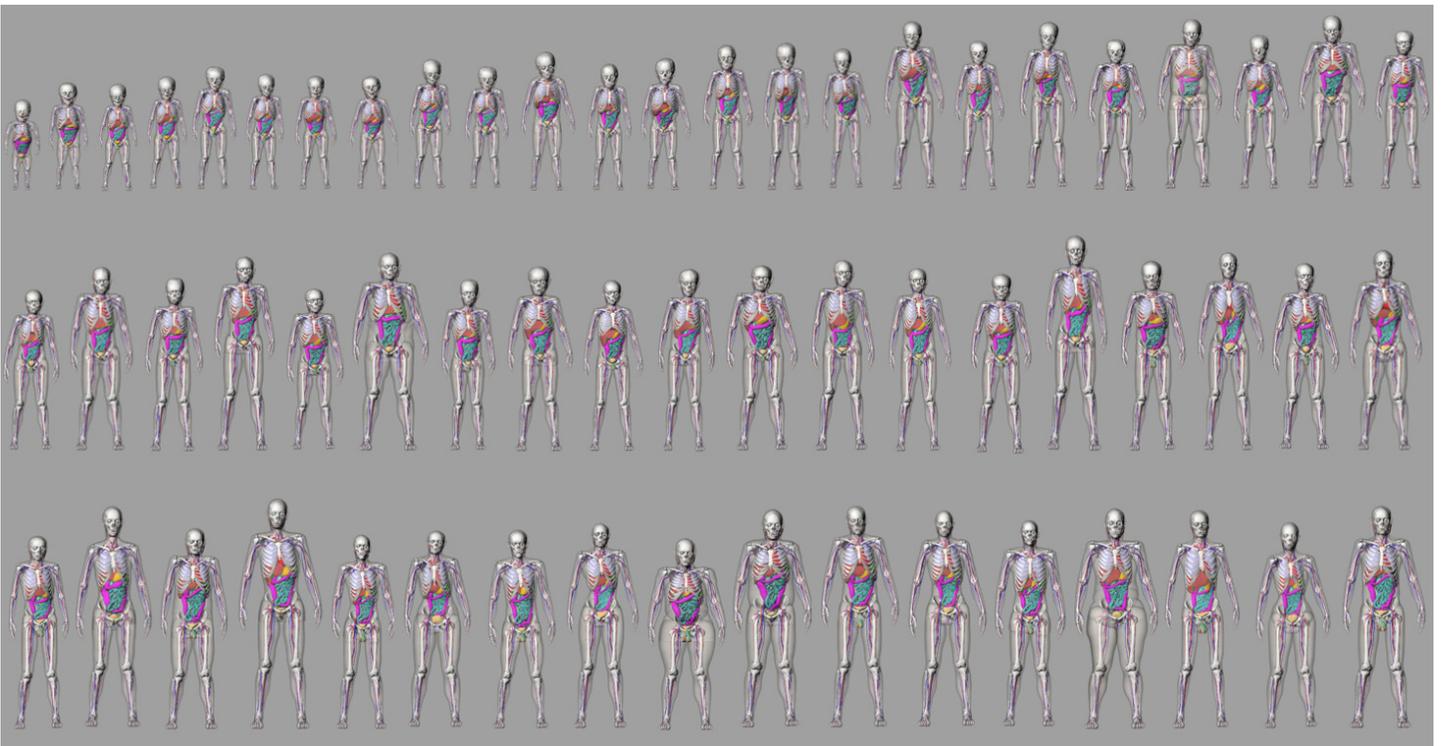
(3512) Detailed Brain Model for Imaging Research

The XCAT brain phantom program includes a highly detailed anatomy for the human brain. Over 100 structures and vessels are modeled based on MRI data. The program will generate voxelized versions of the brain at any user-defined resolution.



(3513) XCAT Library of Anatomical Models

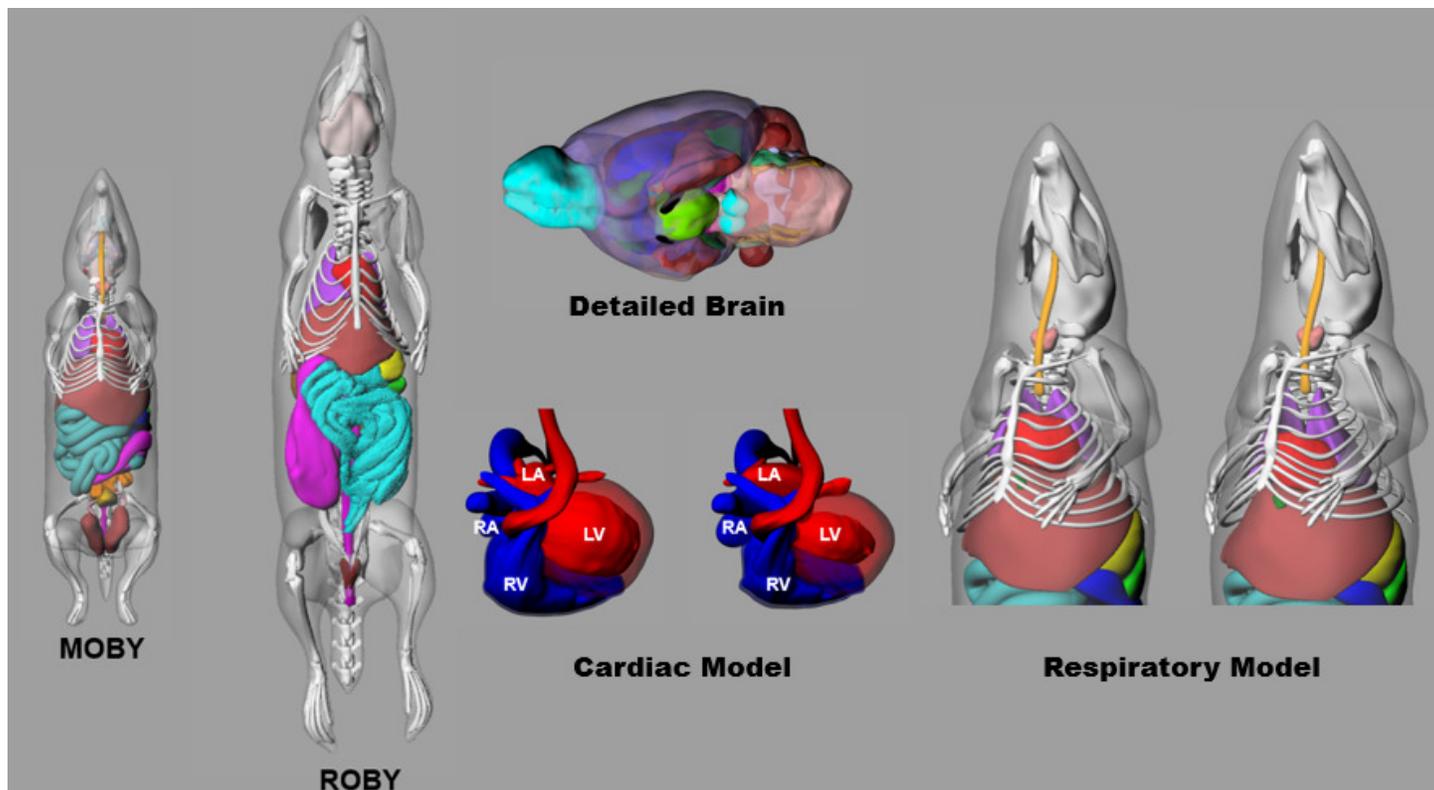
In addition to the standard male and female adult anatomies of the XCAT, we also developed several other models based on CT imaging data. Each model includes the same amount of detail as the original XCAT phantoms and includes parameterized models for the cardiac and respiratory motions. The models range in age from newborn (8 weeks) to elderly adult (78 years old) and cover various height and weight percentiles. Each anatomy was designed to work with the XCAT phantom program (3434). To see information (age, height, weight, gender) on the different models, please contact Paul Segars (paul.segars@duke.edu).



(3431) 4D Rat Whole Body (ROBY) Phantom Version 2.0

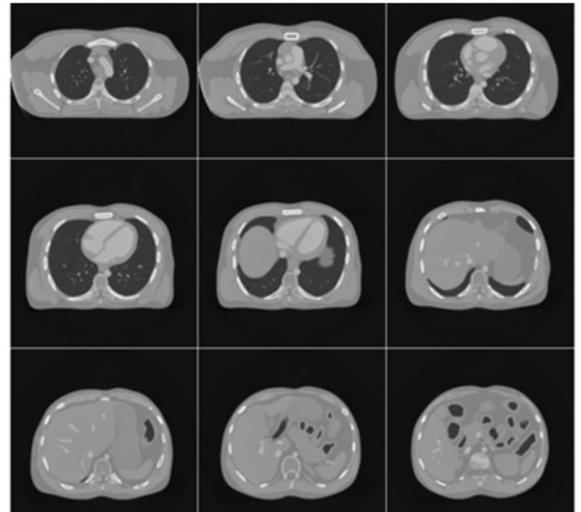
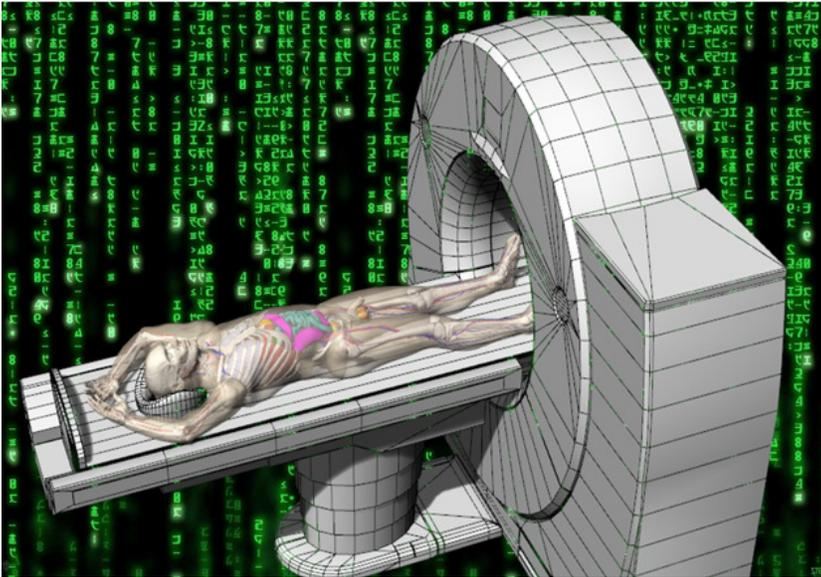
(3433) 4D Mouse Whole Body (MOBY) Phantom Version 2.0

The 4D ROBY and MOBY phantoms were developed for small animal imaging research. They include highly detailed anatomies for a laboratory rat (ROBY) or mouse (MOBY) with over 1400 defined structures. The phantoms were designed to be similar to that of the XCAT human model. The phantoms include parameterized models for the beating heart and respiratory motions as well as numerous parameters to create normal and abnormal anatomical and motion variations. Like the XCAT, the ROBY and MOBY programs include a main phantom function to create voxelized versions of the phantoms as well as cardiac defect, cardiac plaque, lesion, anatomy altering, and vector functions.



(3430) XCAT Phantom CT Projector

The XCAT, MOBY, and ROBY phantoms include a great amount of anatomical detail that make them suitable for use in high-resolution CT imaging research. To simulate CT imaging process, we developed a CT projector that generates x-ray projections directly from surface definitions of a given phantom without using voxelization. It takes output from XCAT, MOBY, and ROBY phantoms and will generate x-ray projections given user parameters defining the scanner. The program can simulate parallel, fan, or cone-beam projections using monochromatic or polychromatic x-ray energy spectra and includes a model for quantum noise.



Simulated CT data