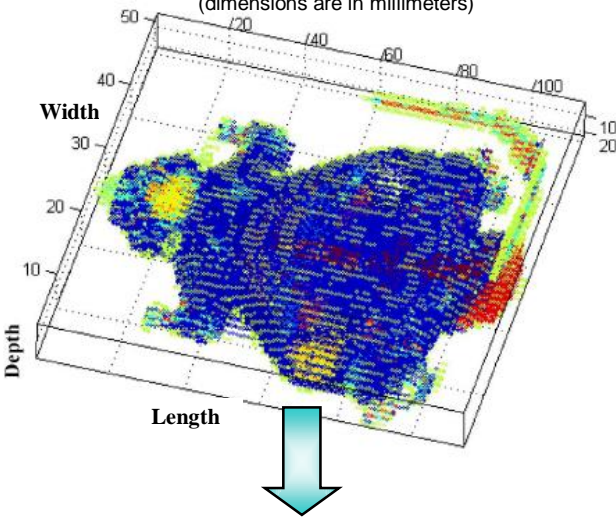


# BioSim: Bio-electric Simulator for Whole Body Tissues

## Simulation Input

Rat model enclosed in a simulation box. Whole-body discretized within a cubic simulation volume. (dimensions are in millimeters)



## Abstract

The Bio-electric Simulator is designed to simulate the response of a tissue or whole-body bio-model to electrical potential and current stimulus through direct electrode contact. The Electrical and Computer Engineering and the Office of Computing and Communications Services at Old Dominion University are using SURAgid to grid-enable this application to utilize concepts such as work-flow and virtual data methods. The Bio-electric Simulator, which is both computation and data intensive, has been demonstrated to scale with the number of processors and can thus benefit from the additional computational resources available through SURAgid.

## Application Project Team

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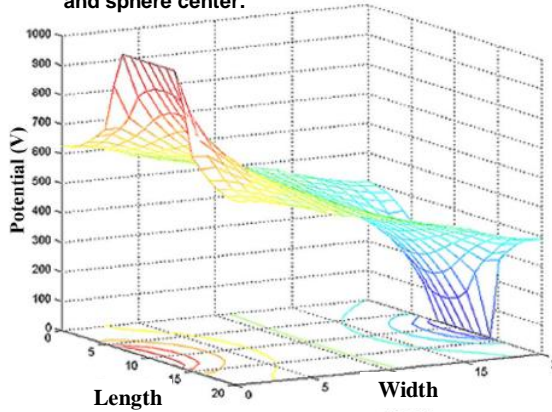
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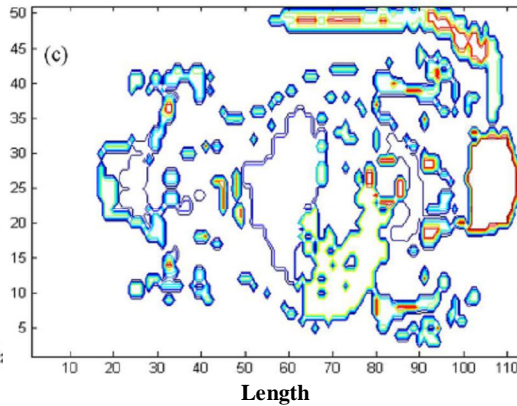
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## Simulate Electrical Potential

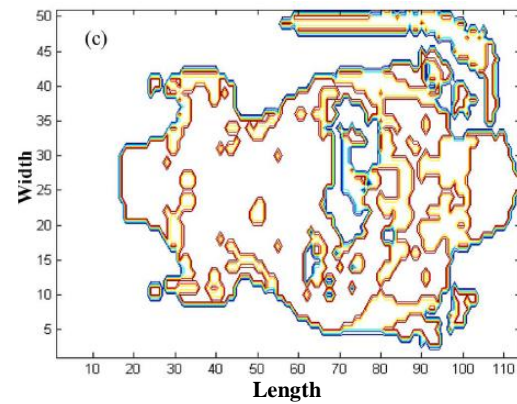
Potential profile in a plane through the electrodes and sphere center.



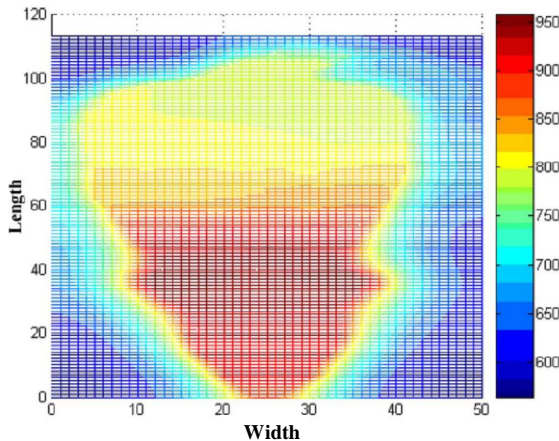
Cross section of the mouse at 18 mm depth



Cross sectional contours of the tissue permittivities for the rat model



**Final output**  
5.775-ns top view of the potential profile at a depth of 12 mm



Application Driven Design for a Large-Scale, Multi-Purpose Grid Infrastructure

