DBP: Simulation of Defibrillation
Implantable Cardiac Defibrillators (ICD)

90,000 annually in the US (2006)
From Images to Models

CT/MRI images  Seg3D

Database of torso models 2, 10, 29 and 40 year old torsos.
Interactive Electrode Placement

SCIRun Program

[Image of a computer program interface with a network of nodes and connections, labeled with various components such as 'SELECT DATABASE FILE', 'SELECT MATLAB MATRIX', and 'Create/Load/Save Colors'].
SCIRun: Problem solving environment:

- **Visual programming paradigm:**
  - Modules
  - Geometry objects
  - Refinement module
  - Clipping module

SCIRun: http://software.sci.utah.edu
Voltage Gradient
Current Density

[Image of a three-dimensional representation of current density with color-coded values ranging from 0 to 2229 A/m².]
Myocardial Voltage Gradients

98.54% > 5 V/cm for 500V shock

4.17% > 30 V/cm for 500V shock
Case Summary
Residual Objects Can Alter Defibrillation

Example: Spinal Rods can change DFT by -20 to +5 J
Future Plans