NA-MIC
National Alliance for Medical Image Computing
http://na-mic.org

Slicer Progress in 2008

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Topics

- 2008 Year in Review
- Highlights
  - Collaborations You May Not Hear About in Other Talks Today
- Plans for This Week and Beyond

Slicer Background

- 3D Slicer Role in NA-MIC
  - Translation Platform to get Medical Computing Technology to DBP Researchers
  - Provide Reference Implementation using NA-MIC Kit
  - Part of NA-MIC Outreach to New Applications
- ~80% Rewrite from slicer2 to slicer3
- First Slicer3 svn commit: January 26, 2006

Progress in 2008

- Numbers 2008
  - Subversion Commits: 2,971 (8,317)
  - Lines of Code*: 735,536
  - Bugs & Features:
    - 239 Submitted
    - 129 Closed
  - Active Developers†: 53
- 3D Slicer Version 3.2
  - Released August 8, 2008

- Numbers 2007
  - Subversion Commits: 3,407
  - Lines of Code*: 371,428
  - Bugs & Features:
    - 154 Submitted
    - 63 Closed
  - Active Developers†: 33

*: find . -iname *.h -o -iname *.cxx -o -iname *.tcl -o -iname *.java -o -name *.py | grep -v svn | xargs wc
(does not include libraries or modules in external repositories)
†: svn log | grep "^r" | cut -d " " -f 3 | sort | uniq | wc

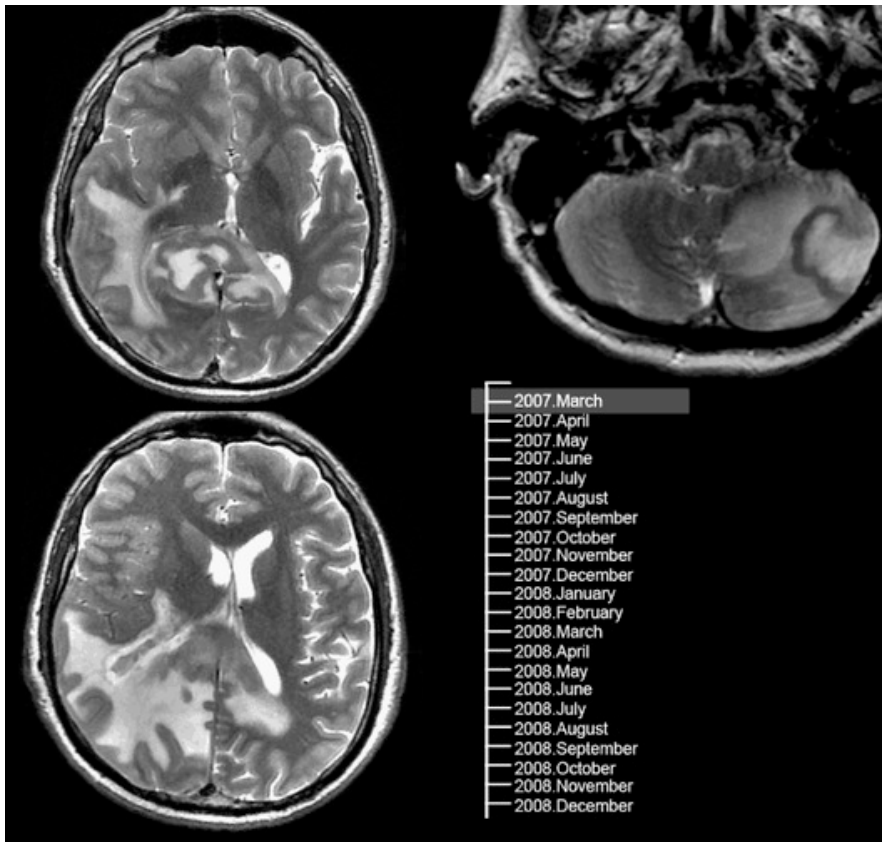
Current State

- Base Code is Stabilizing
  - The Remaining Bugs are the “Deep” Ones
- “Real” End Users Appearing
  - People Spend Hours a Day in Slicer3
- Very Active Development

- *Bugs, Performance and Usability are Still Major Issues for 2009*

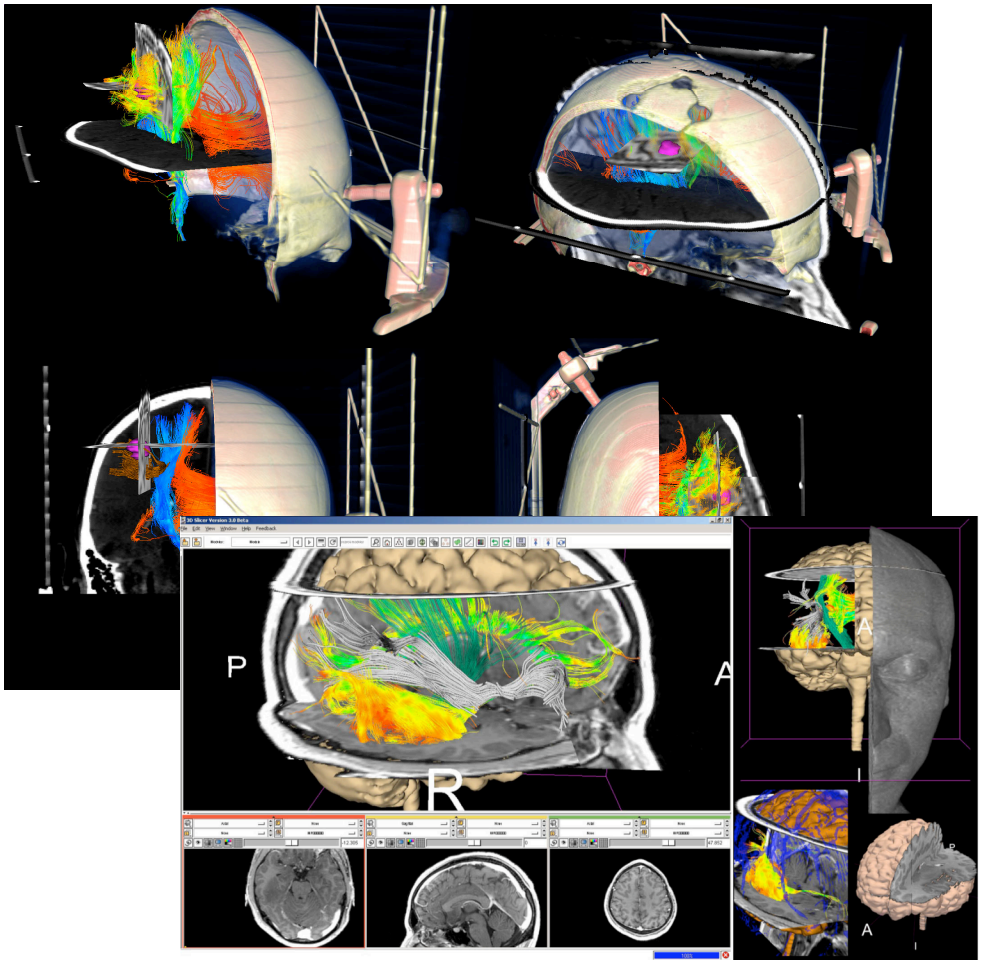
Logitudinal Registration

- Radiotherapy of B-Cell Lymphoma
- 13 MRI, Intensity Normalized and Registered to “Cured” Final Scan
- ITK Mattes MI Registration in Slicer2
- Video courtesy by Ervin Berenyi and Andras Jakab, Department of Medical Laboratory and Diagnostic Imaging, University of Debrecen Medical School and Health Science Center.



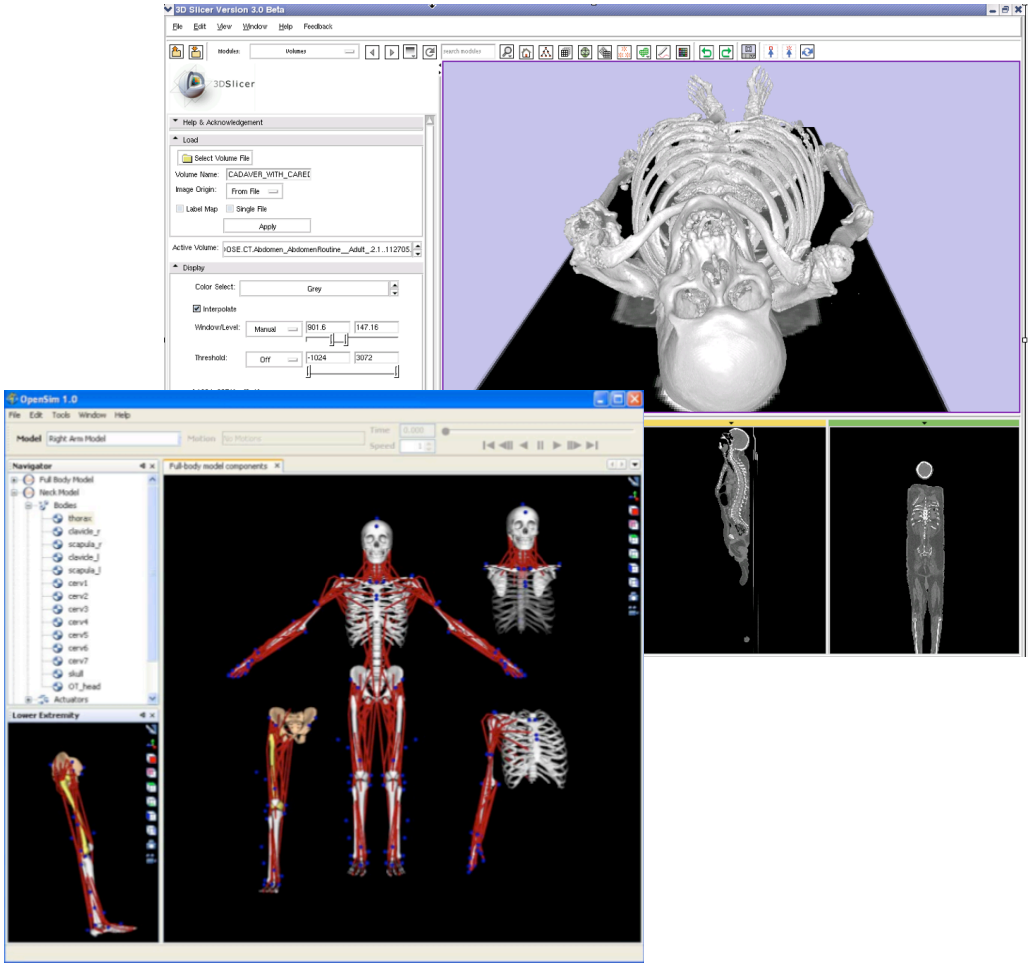
Radiotherapy Visualization

- Gamma Knife Planning and Visualization
- Registered CT and DTI
- Segmentation, Tractography, and Cropped Volume Rendering
- 2nd Place in Kitware Visualization Contest
- Images courtesy by Ervin Berenyi and Andras Jakab, Department of Medical Laboratory and Diagnostic Imaging, University of Debrecen Medical School and Health Science Center.



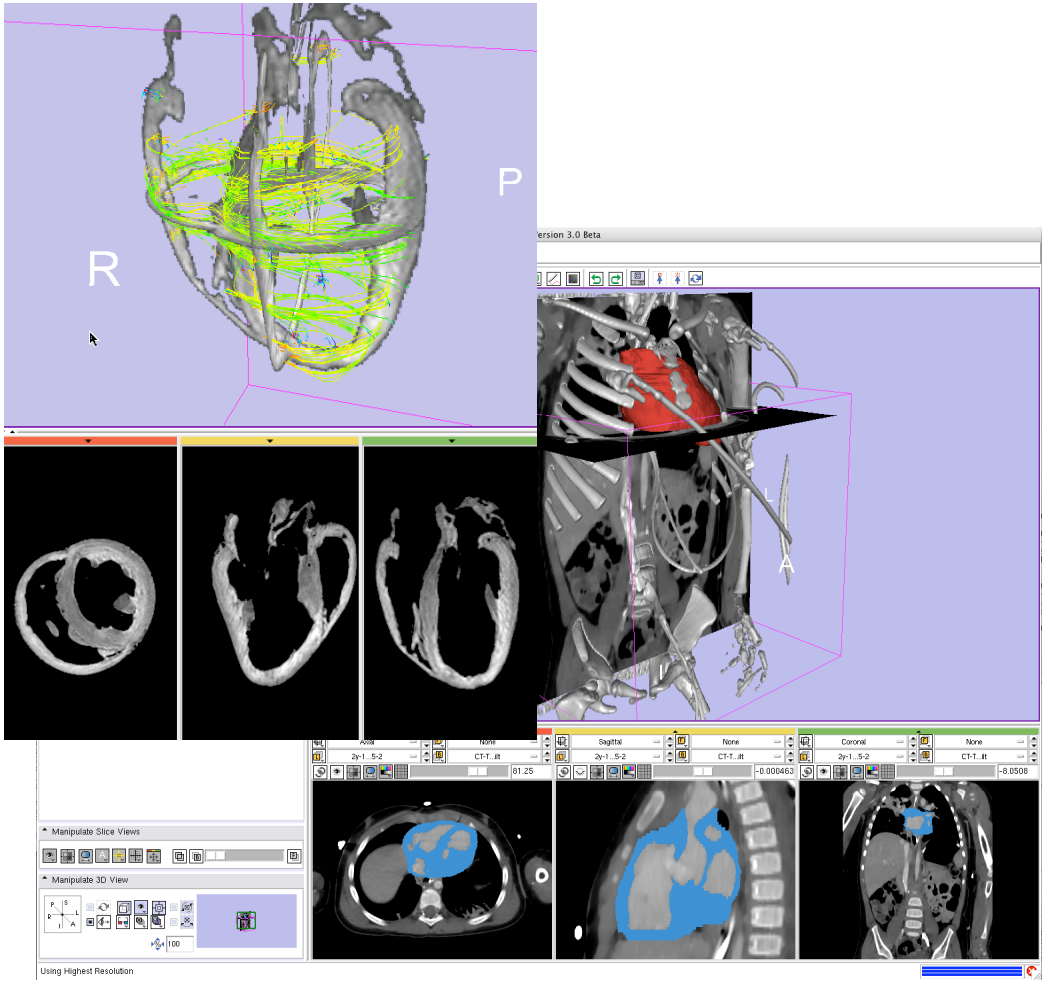
SIMBIOS Collaboration

- OpenSIM (Scott Delp et al, Stanford University)
  - Full Body Biomechanical Simulations of Musculoskeletal Dynamics
- WashU Full Body CT Data Collection (1mm isotropic: 512x512x1700)
- Goal: Pipeline for Subject-Specific Model Creation



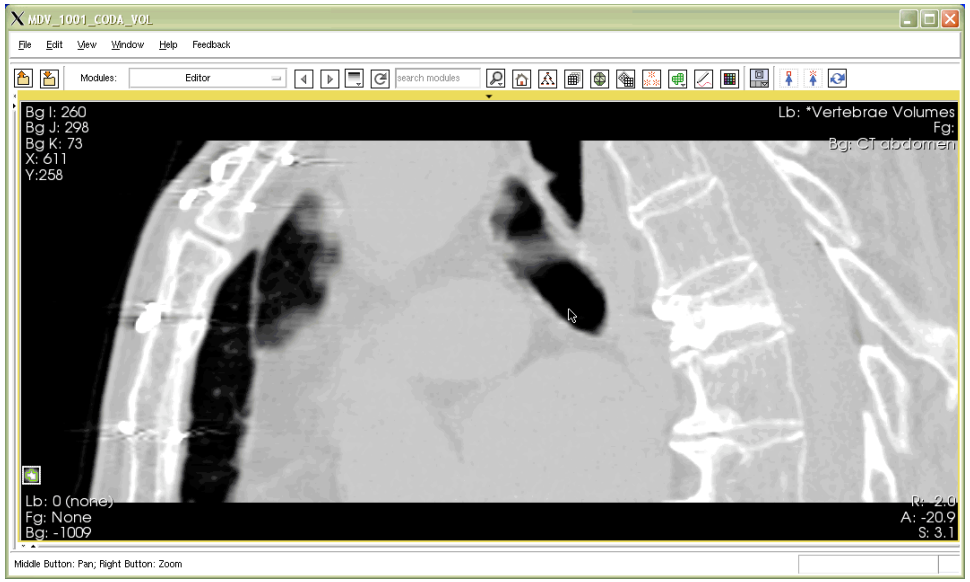
Cardiovascular

- JHU CVRG (Winslow, Miller et al)
  - Ex vivo Canine DTI
- Harvard/Childrens (Tiedman), Stanford (Jolley), SCI
  - Subject-Specific Defibrillation Simulation
- Utah DBP (MacLeod)
  - Image Guided EP Ablation



Orthopedic Clinical Trials

- Measurement of Bone Cement Effectiveness
- Based on ITK-Based Level Tracing Filter Implemented in Slicer3 Editor Module (Miller, Pieper)
- Extended with Constraints and Applied to Clinical Trials by Andrew Li et al (Synarc)
- Li and 2 Colleagues attended NA-MIC Training at Stanford (Co-sponsored with SIMBIOS)



OpenIGTLink

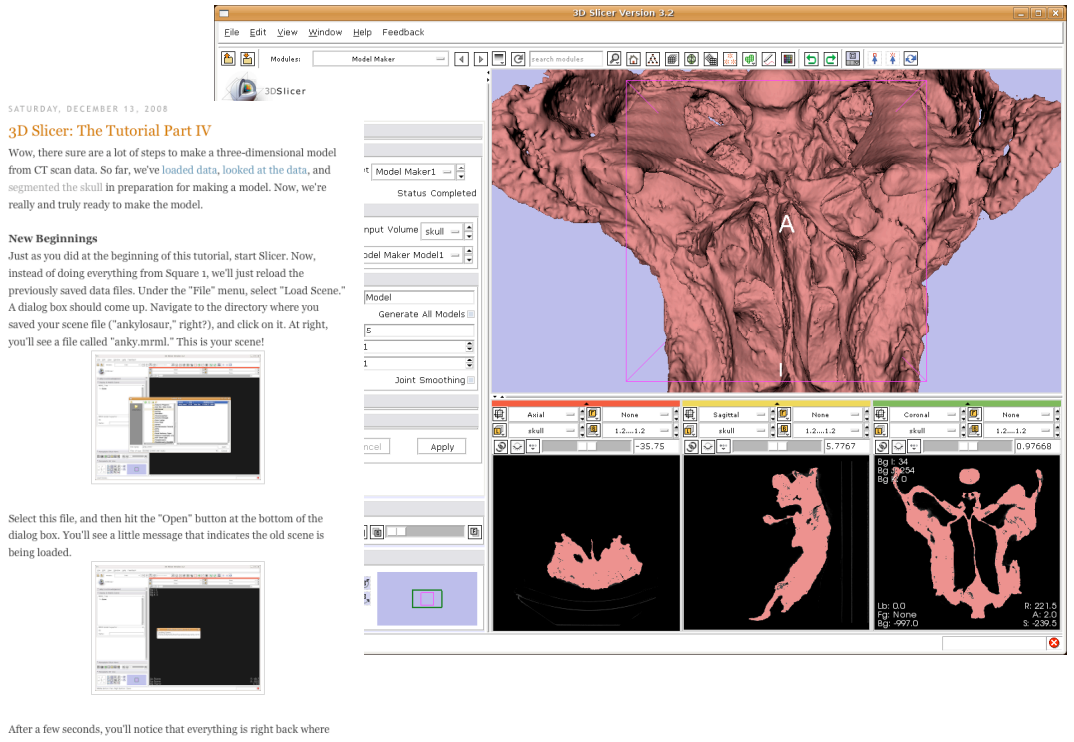
- December 2007: Concept
- January 2008: Prototype and Name
- July 2008: BrainLab VVLink with Yale (Papademetrios)
- December 2008: Real Time MR Control
- TODO 2009: Initial Clinical Application

- Multi-Site Collaboration coordinated by NCIGT (Jolesz, Hata et al)

Paleontology

- Four Part Online Tutorial
- Segmentation, Modeling, and Measurement of CT Scan of Ankylosaur Fossil

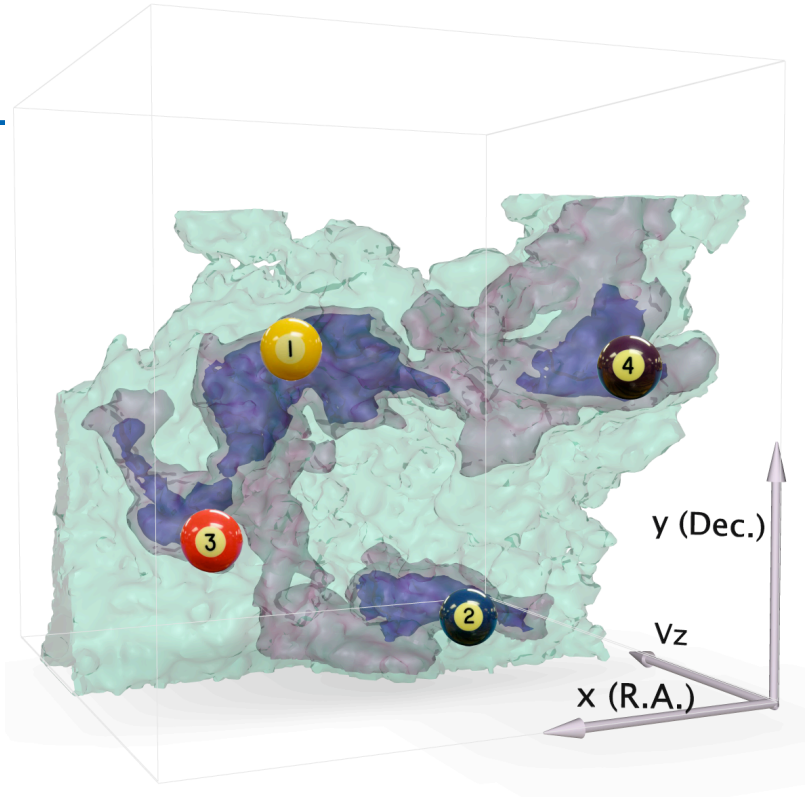
Images Courtesy Andrew A. Farke, Ph.D.
Curator of Paleontology
Raymond M. Alf Museum of Paleontology
Claremont, CA



THE OPEN SOURCE Paleontologist

Astronomy

- Multi-Scale Study of Self Gravitational Effects in Star Formation
  - Statistical Clustering and Image Analysis
- *Nature* Publication January, 2009
  - NA-MIC and 3D Slicer Acknowledgements
  - “Live” 3D Models in Acrobat Paper Exported from 3D Slicer
- Harvard IIC Collaboration (Goodman, Halle et al)



Major Projects for 2009

- Continuous Improvement
  - Modularity, Usability, Performance, Quality, Functionality…
- User Support
  - We Hope to be Victims of Our Success…