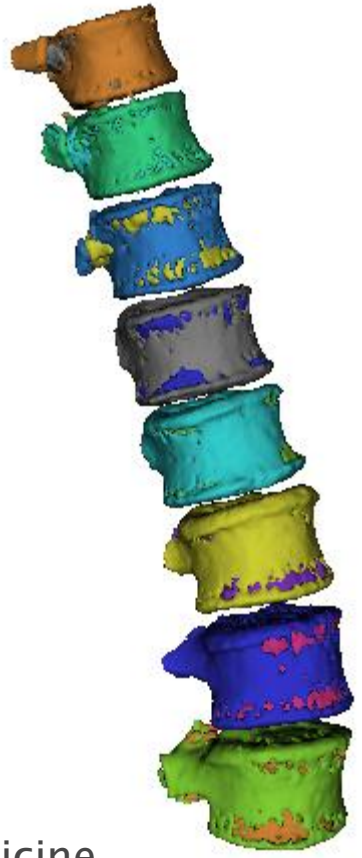
National Alliance of Medical Image Computing
2011 summer project week, MIT, Boston

Spine Segmentation & Osteoporosis Screening in CT



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Screening for Osteoporosis in CT Scans

- ***Osteoporosis*** *– A condition of decreased bone mass leading to fractures*

- ***Common***
  - 1.5 million vertebral fractures per year (US)
  - 180 thousand patients placed in nursing homes per year (US)

- ***Devastating & Costly***
  - immobility, pain, mortality
  - 18 billion dollar per year (US)

- ***Preventable & Treatable***
  - diet, exercise
  - quit smoking & access drinking
  - medication, fall prevention, etc…

- ***Under Diagnosed***
  - DXA screening has low compliance rate
  - Frequently missed in CT

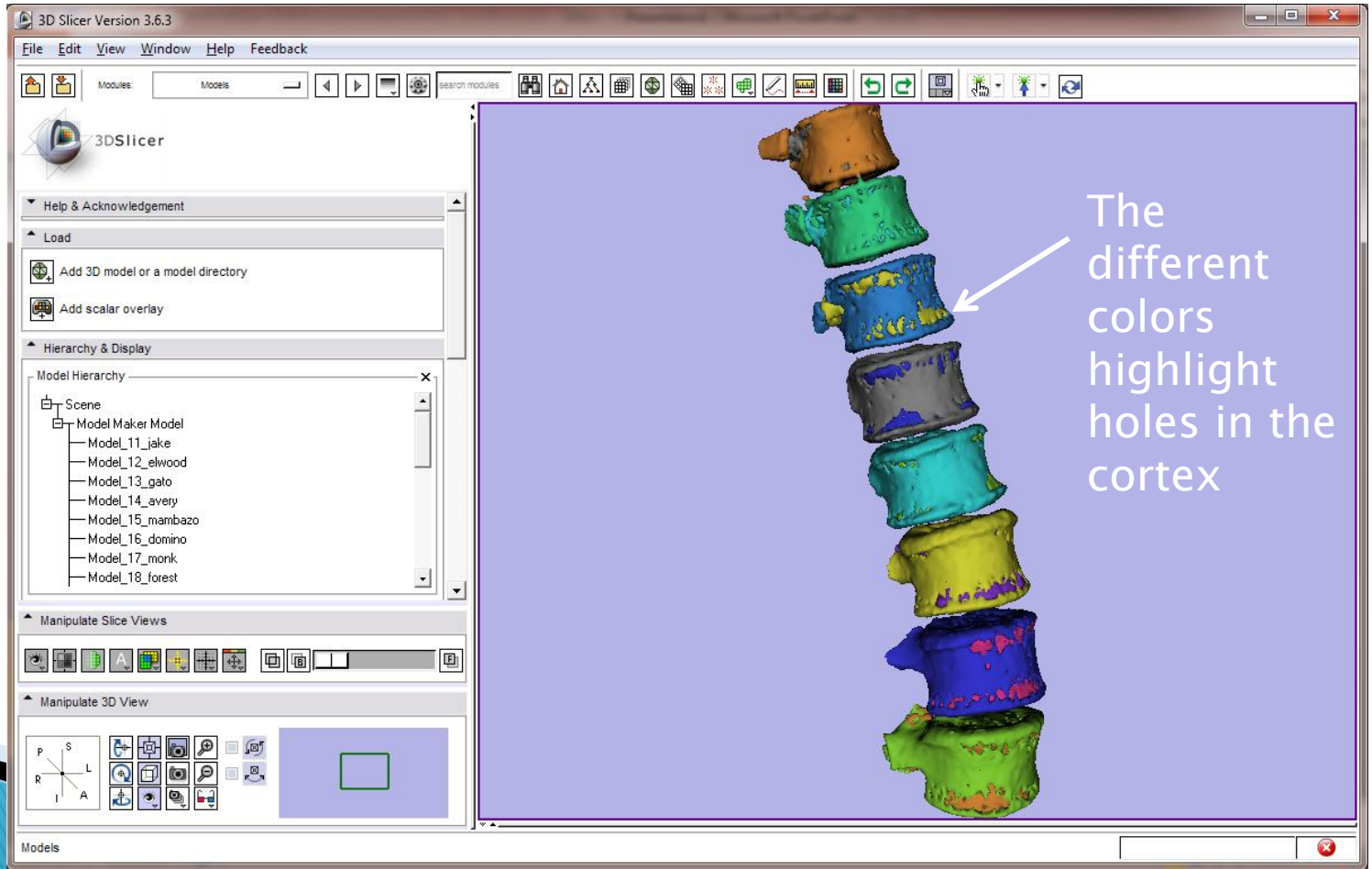
Our Solution

Automated screening for findings of osteoporosis in CT scans performed for other clinical reasons

Detect: Vertebral fractures, Low bone density Etc.

Milestone 1 – Spine Segmentation

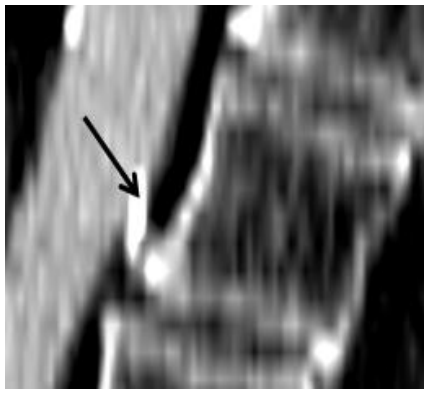
- NA-MIC Spine Segmentation Challenge + full automation
- Slicer integration
  - Basic integration complete: Spine Segmentation Module + Tutorial
  - Atlas integration in the works



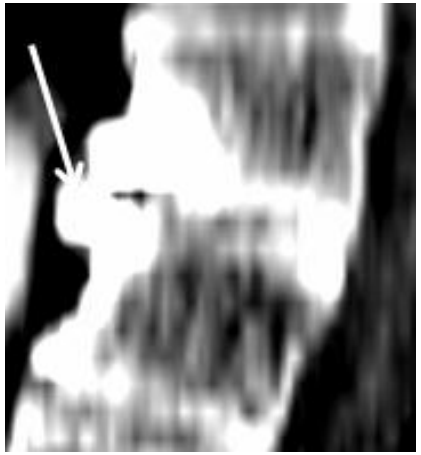
Not a Silver Bullet (yet)

- Abdomen CT only. Chest CT in next milestone.
- Tested on Windows 7 64 bit, 3DSlicer 3.6.3
- Mapping to formal vertebrae labels – TBD
- Known issues to be resolved in next milestone:
  - Calcifications
  - Contrast

Need to Remove calcification in the aorta



But keep osteophytes



- Availability
  - Segmentation module expected to be available for NA-MIC research community, pending legal review.
- More details
  - Anthony.Blumfield@Radnostics.com
- Thank you