# Sneak Preview of Next Generation SCIRun Features and Directions

# Overview

Goals: Stability, Modularity, Efficiency, Apps

## Core Encapsulation
- **SCIRun is more than dataflow…**

## Regression Testing System
- **CMAKE, CTEST, DART, …**

## Segmentation App ("widget")
- **From raw images to label maps**

## Mesh Generation App ("widget")
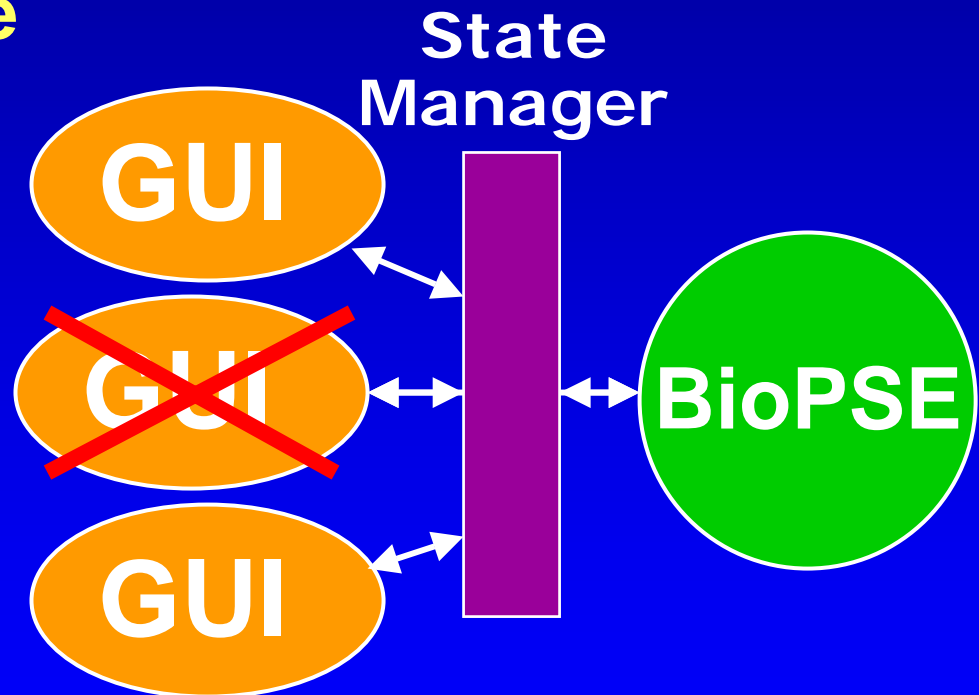- **From voxels to meshes**

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# GUI Separation

Goals: Stability, Modularity, Efficiency, Apps

## State and Event Management

- **Detachable interface**
- **Reproducibility**
- **Collaboration**
- **Remote vis**
- **Custom UI**
- **Scripting**
- **Regression testing**



State Manager

GUI

GUI

GUI

BioPSE

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# Core Encapsulation

**Top Secret**

*Taking "GUI Separation" Even Further*
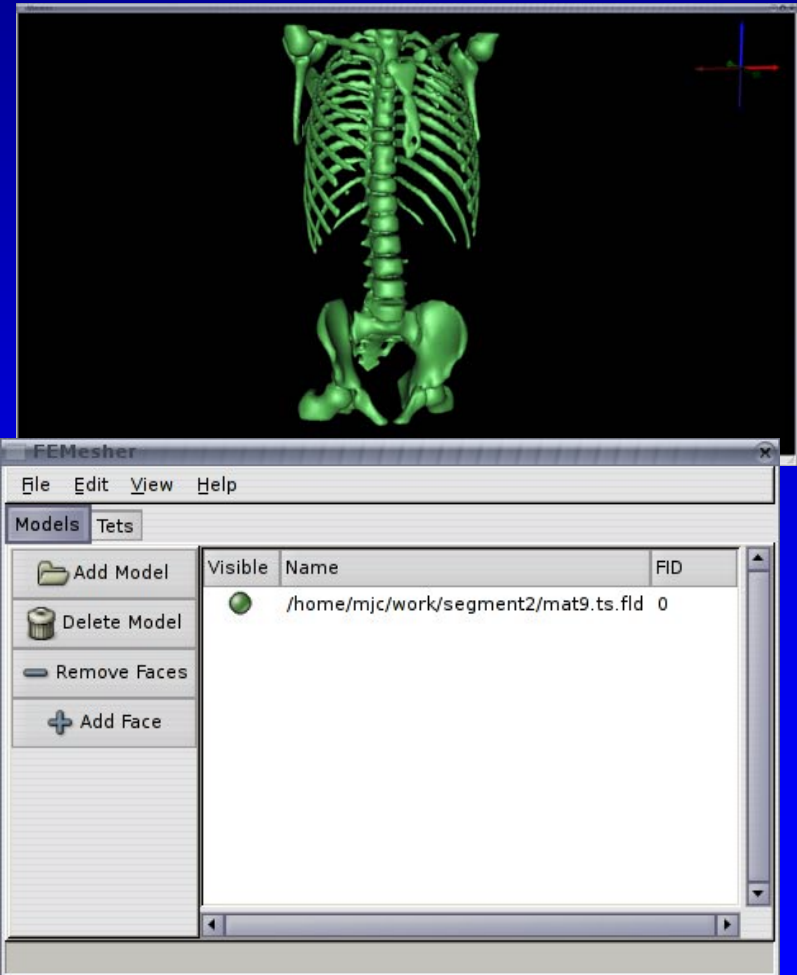
**Algorithm Layer**

- **Move "guts" of Modules into Algorithms (from Dataflow directory to Core directory)**

**PowerApps Built Without Dataflow**

**Applications Built Directly From Algorithms**

**Dataflow Runs Without a GUI**

**State and Event Manager**

**Release Core As Its Own "Product"**



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# Regression Testing System

**Goals: Stability, Modularity, Efficiency, Apps**

**Top Secret**

## CMAKE, CTEST, DART
- **Continuous, nightly, and experimental builds for various BioPSE projects (and Teem)**

## Hardware Farm
- **Dedicated resources (also used for demos)**
- **Nightly resources (developers' machines)**
- **Outside resources**

## Developing a Suite of Tests
- **Command-line executables**
- **Logging and replay for end-user applications**

## Mini Releases



Dashboard – 8/16/06 9:59 PM

http://dashboards.sci.utah.edu:8081/CIBC/Dashboard/Dash RSS

CIBC Workshop   CIBC Dashboard   Canon Paper   EAB05   BizPlan Writing   SBA BizPlan   ExecSum Writing   Cardio-MDC

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**CIBC Dashboard**

**August 16, 2006 9:59:59 PM MDT**

Repository   Documentation >   Bugs   Home

[Nightly] [Continuous] [Experimental] [Weekly] [Coverage] [Style] [DynamicAnalysis]

« Nightly - 8/15/06 10:00 PM to 8/16/06 10:00 PM »

| Site | Build Name ↑ | Update | Build | | | Test | | | | TimeStamp |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Error | Warning | Time | NotRun | Failed | Passed | Time | |
| cheese.sci.utah.edu | Linux-gcc-3.3.5 | 1 | 50 | 45 | 19.1 | 0 | 0 | 6 | 0.0 | 8/15/06 10:00 PM |
| pepper | Linux-gcc-4.1.0 | 0 | 50 | 7 | 5.2 | 0 | 0 | 6 | 0.0 | 8/15/06 10:00 PM |

[Nightly] [Continuous] [Experimental] [Weekly] [Coverage] [Style] [DynamicAnalysis]

« Continuous - 8/15/06 10:00 PM to 8/16/06 10:00 PM »

| Site | Build Name | Update | Build | | | Test | | | | TimeStamp ↓ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Error | Warning | Time | NotRun | Failed | Passed | Time | |
| pepper | Linux-gcc-4.1.0 | 1 | 0 | 2 | 5.2 | 0 | 0 | 6 | 0.0 | 8/16/06 1:13 PM |

[Nightly] [Continuous] [Experimental] [Weekly] [Coverage] [Style] [DynamicAnalysis]

« Experimental - 8/15/06 10:00 PM to 8/16/06 10:00 PM »

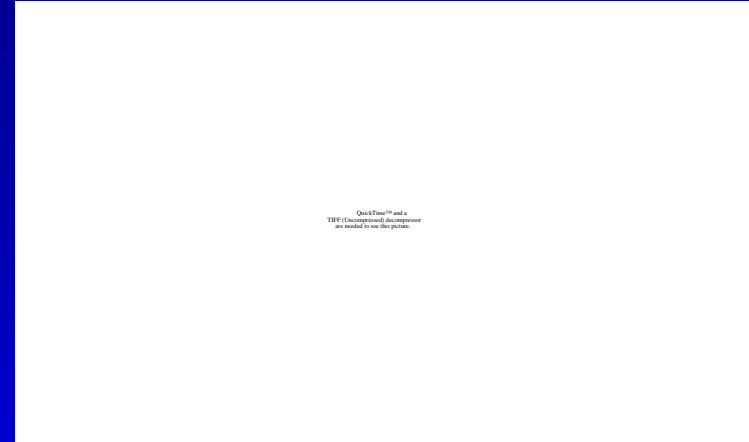| Site | Build Name | Update | Build | | | Test | | | | TimeStamp ↓ |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Error | Warning | Time | NotRun | Failed | Passed | Time | |
| stripe.sci.utah.edu | Darwin-gcc-4.0.1 | | 60 | 15 | 7.8 | 0 | 0 | 6 | 0.0 | 8/16/06 7:00 PM |
| stripe.sci.utah.edu | Darwin-gcc-4.0.1 | | 0 | 0 | 0.0 | 0 | 0 | 1 | 0.0 | 8/16/06 6:25 PM |
| cheese.sci.utah.edu | Linux-gcc-3.3.5 | | 0 | 2 | 22.9 | 0 | 0 | 6 | 0.0 | 8/16/06 6:17 PM |
| pepper | Linux-gcc-4.1.0 | | 0 | 2 | 5.1 | 0 | 0 | 6 | 0.0 | 8/16/06 3:47 PM |
| pepper | Linux-gcc-4.1.0 | | 0 | 0 | 0.0 | 0 | 0 | 6 | 0.0 | 8/16/06 1:23 PM |
| cheese.sci.utah.edu | Linux-gcc-3.3.5 | | 0 | 0 | 0.0 | 0 | 0 | 6 | 0.0 | 8/16/06 8:34 AM |
| pepper | Linux-c++ | | 0 | 0 | 0.0 | 0 | 0 | 6 | 0.0 | 8/16/06 7:36 AM |

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# Segmentation App

**Goals: Stability, Modularity, Efficiency, Apps**

**From Imaging Data to Segmentations**

**Photoshop Style Interface**

- **Operations produce layers**
  - **ITK filters**
  - **Manual editing**
- **Binary operations**
- **Composited rendering**

**Slice-Based 2D Vis**

**Volume Rendering-Based 3D Vis**

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

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TIFF (Uncompressed) decompressor
are needed to see this picture.

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# Meshing App

**Goals: Stability, Modularity, Efficiency, Apps**

## From Segmented Voxels to Unstructured Meshes

- **Volumes and Surfaces**

## Preserve Labels

## Preserve Geometric Features

- **Conform to boundaries**
- **Heterogeneous**
- **Anisotropic**

## Bridge to Other Meshing Tools

- **TetGen**
- **afront**

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

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