

August 6, 2013

VTK 6 Changes and Migration to MITK

Bugsquashing Seminar

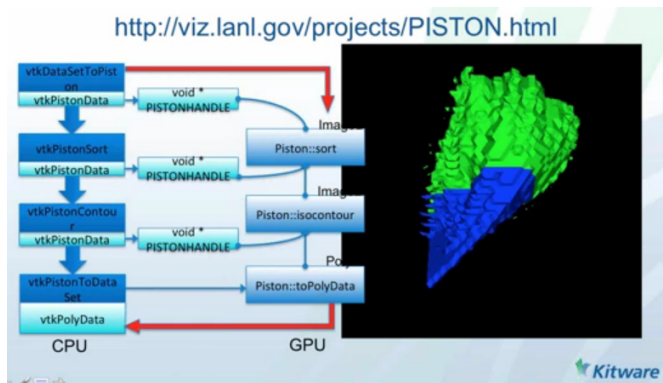
Topics

1 New Features

2 Major Changes and Migration to MITK

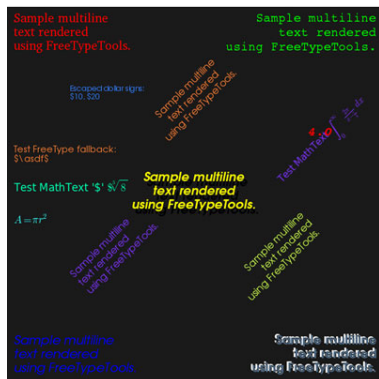
GPU filters in VTK

- Interface to PISTON library via vtkPistonData
- ⇒ VTK filters with GPU processing



Improved vtkTextRenderer

- various text rendering back ends



Improved vtkTextRenderer

- various text rendering back ends
- Matplotlib's latex style equation markup

Bézier curve:
Bezier curve

$$B_{[0,n]}(t) = \sum_{j=0}^n t^j \left[\frac{n!}{(n-j)!} \sum_{i=0}^j \frac{(-1)^{i+j} P_i}{i!(j-i)!} \right] = (1-t)B_{[0,n-1]}(t) + tB_{[1,n]}(t)$$

Improved vtkTextRenderer

- various text rendering back ends
- Matplotlibs latex style equation markup
- **SVG and PDF Image export**

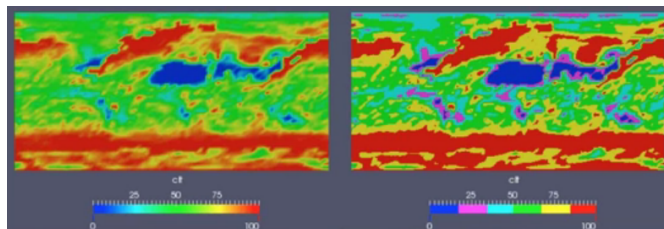
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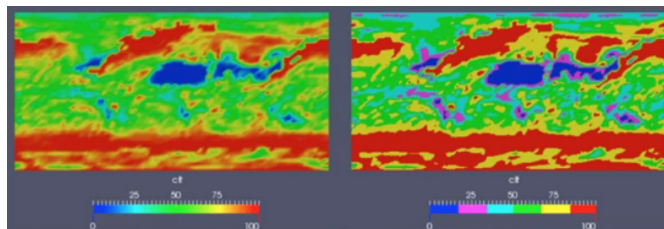
Discrete Lookup Tables

- LUTs with abrupt transitions



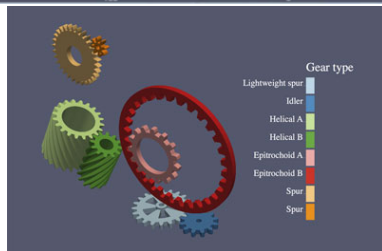
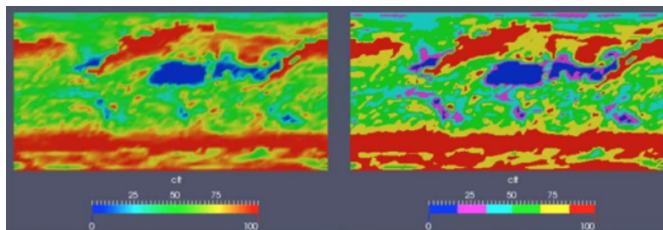
Discrete Lookup Tables

- LUTs with abrupt transitions
- named colors (string to color)



Discrete Lookup Tables

- LUTs with abrupt transitions
- named colors (string to color)
- improvements to color and LUT widgets



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- Mesa \geq OpenGL 1.1 support
- Interactive 3D Charts
- R interface improvements

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- QT5 in VTK 6.1

1 New Features

2 Major Changes and Migration to MITK

Modularization

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- Remove modules by deleting them
- Modules can be easily added

Removed Classes

- ~ 105 removed classes
- VTK4 compatibility (vtkXtoYFilter) → used only once in MITK
- TextAnalysis and QtCharts removed → not used in MITK
- deleted vtkFloatingPointType → replace by double
- deleted vtkCxxRevisionMacro → not needed
- renamed vtkTypeRevisionMacro → vtkTypeMacro
- ...

Rearranged Pipeline

- Separate Algorithms and Data
- *SetInput* → *SetInputConnection* to connect Pipeline
- *SetInput* → *SetInputData* Set data without connecting pipeline

Rearranged Pipeline - Example 1

VTK 4/5

```
vtkDataObject* output = aFilter->GetOutput();  
anotherFilter->SetInput(output);
```

VTK 6

```
anotherFilter->SetInputConnection(aFilter->GetOutputPort());
```

Rearranged Pipeline - Example 2

VTK 4/5

```
vtkPolyData *pd = vtkPolyData::New();  
aFilter->SetInput(pd);
```

VTK 6

```
vtkPolyData *pd = vtkPolyData::New();  
aFilter->SetInputData(pd);
```