



NA-MIC

*National Alliance for Medical Image Computing*

*<http://www.na-mic.org>*

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# **The NA-MIC Programming Environment**

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Harvard University

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# The NA-MIC Kit



3DSlicer





# NA-MIC Kit Goals

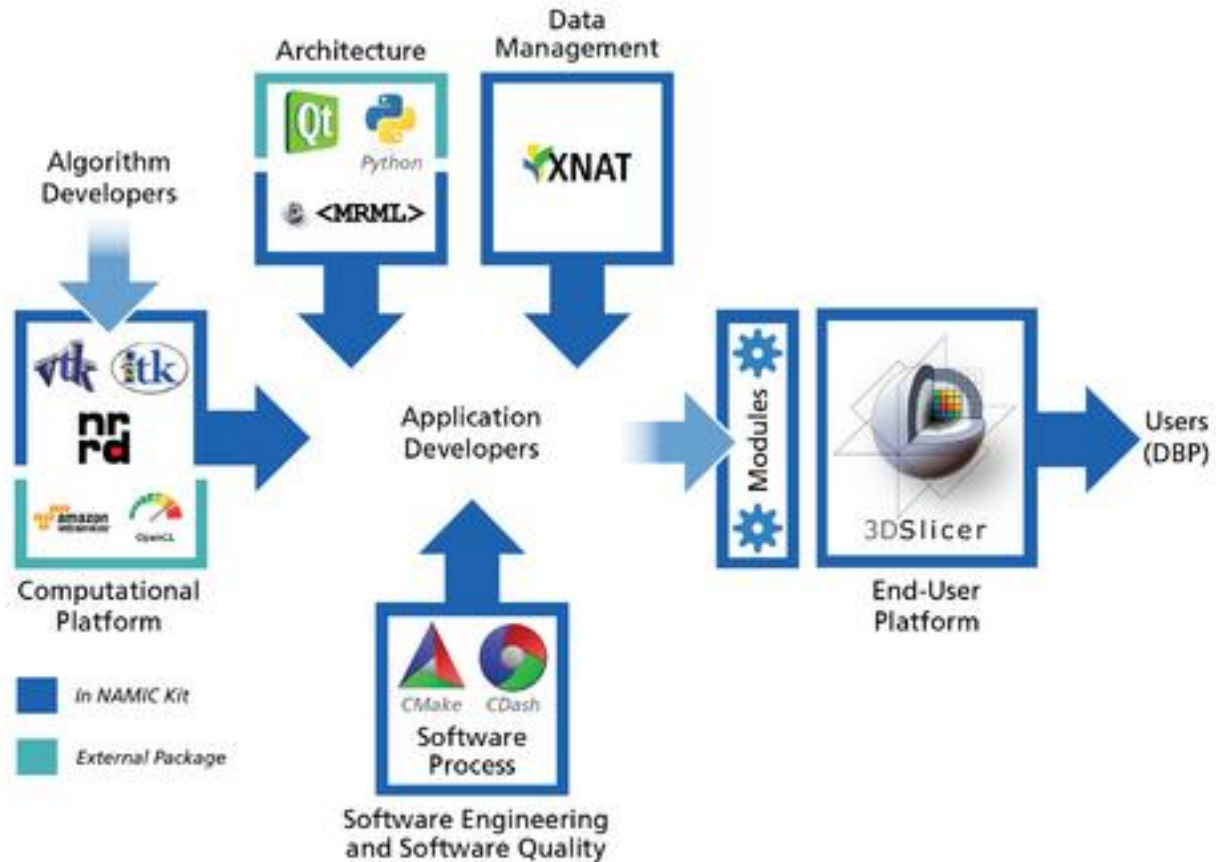
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- Software and Methodologies for Medical Image Computing
  - Facilitate Research
  - Promote Interoperability
- Stable, Cross-Platform Run Time Environment
  - Full Set of Core Features
  - Avoid Duplicated Effort
- Flexible Module Architecture
  - Plug-ins should be As Simple As Possible

Slide courtesy of Jim Miller, Ph.D.



# The NA-MIC Kit





# 3D Slicer

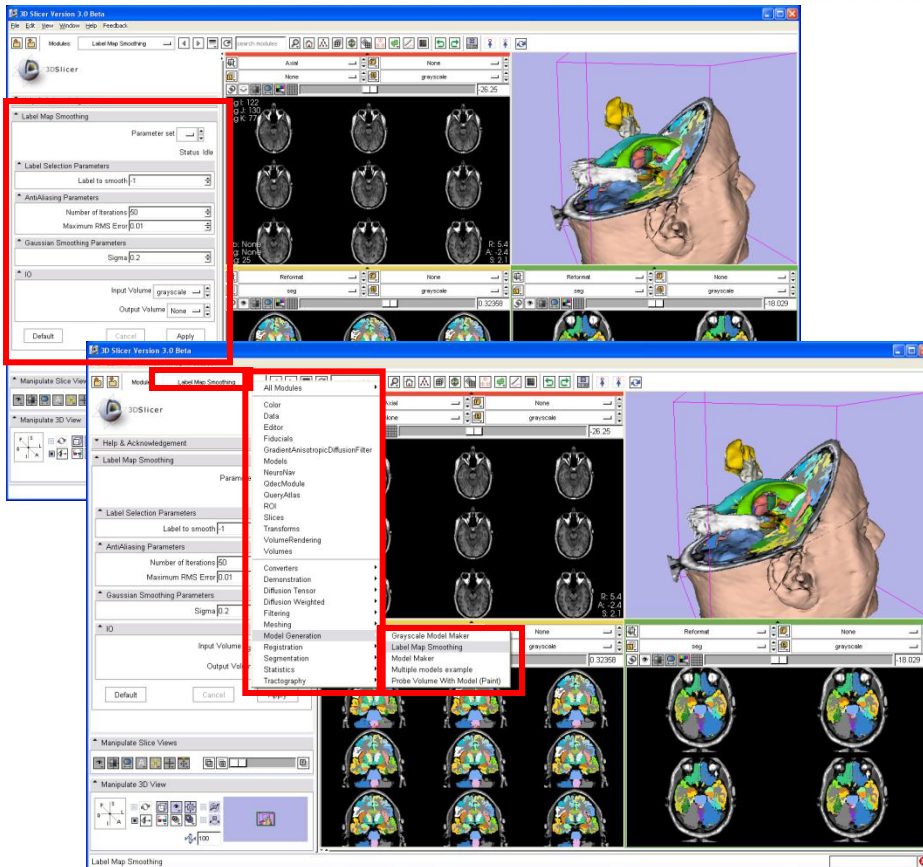
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- An **end-user application** for image analysis
- An **open-source environment** for software development
- A software platform that is both **easy to use** for clinical researchers and **easy to extend** for programmers



# Modules Types



- Built in modules
- Loadable modules
- Scripted modules
- Command line modules

Images courtesy of Jim Miller, Ph.D.



# CLI Integration: Hello World Course

## Programming into Slicer3

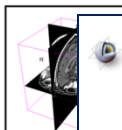
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Harvard University



*HelloWorld\_CourseMaterial.tgz archive*

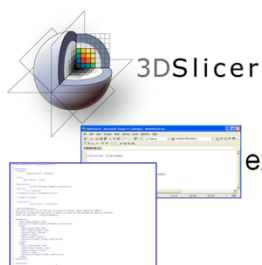
```
tar -zxvf the HelloWorld_Plugin.tar.gz
```



*Modifying the source code*

Add the following lines to the file HelloWorld.cxx

```
#include  
#include  
int main  
{  
    PAR  
    std::c  
    retu  
}
```



3DSlicer

Part A:  
Integrating an  
executable into Slicer3

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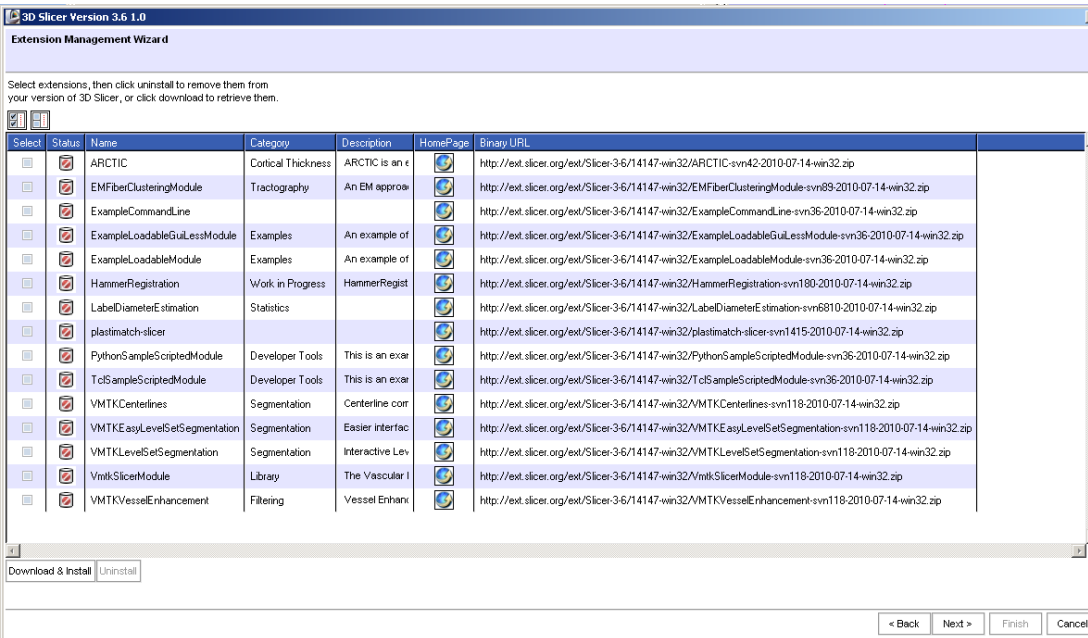
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Programming course  
on the mechanism to  
plug-in an external  
program into Slicer



# Going Further: Extensions

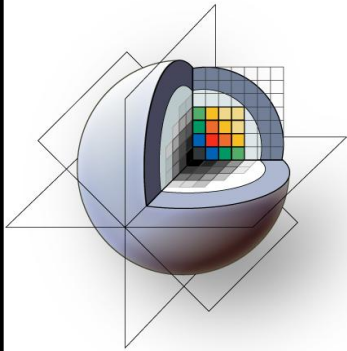


- Individual identity of modules
- Allow users to assemble their own set of tools
- Easy to download compatible extensions



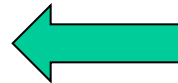


# Daemon



3DSlicer

```
slicerget.tcl name > image.nrrd
```



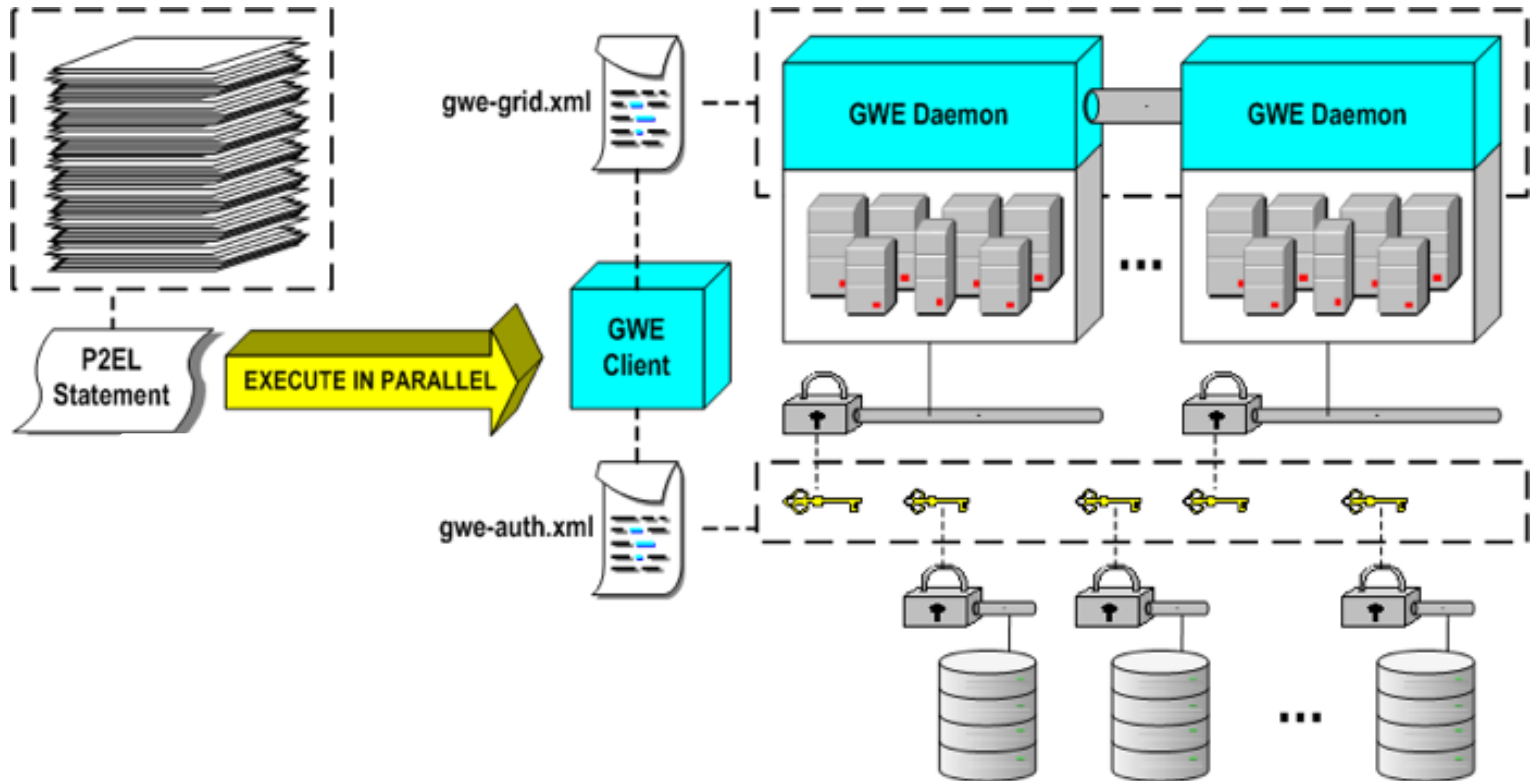
```
cat image.nrrd | slicerput.tcl name
```

YourTool

Slide courtesy of Steve Pieper, Ph.D.



# Batch Processing



<http://www.gridwizardenterprise.org/>



# Parameter Space Exploration

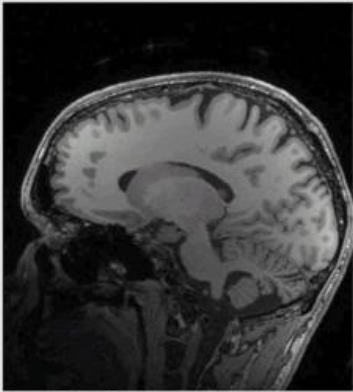
Lock	Field	Selection/ Variants	Value Selection	Value
<input type="checkbox"/>	Record Number	925/1086		925
<input type="checkbox"/>	Run	925/1086		925
	SLICER_HOME	1/1		/Users/admin/GSlicer3-3.3-alpha-2009-02-01-darwin-x86-0.7.2.alpha
	volumes_files_dir	1/1		/demos.1/gwe/data
	volumes_name_regexp	1/1		*[.](nrrd nhdr)
<input type="checkbox"/>	volumes_filenames	1/2		/demos.1/gwe/data/brain.nrrd
<input type="checkbox"/>	axis	3/3		2
<input type="checkbox"/>	plane	101/181		120
<input type="checkbox"/>	sliceGenerationCommand_FILE_SLICE	925/1086		 /demos.1/gwe/data/brain.nrrd-out/2-120.png
<input type="checkbox"/>	sliceGenerationCommand	925/1086		<code>mkdir -p /demos.1/gwe/data/brain.nrrd-out &amp;&amp; /Users/admin/GSlicer3-3.3-alpha-2009-02-01-darwin-x86-0.7.2.alpha/Slicer3 --launch unu slice -a 2 -p 120 -i /demos.1/gwe/data/brain.nrrd -o /demos.1/gwe/data/brain.nrrd-out/2-120.png.tmp.nrrd &amp;&amp; /Users/admin</code>

Image courtesy of Marco Ruiz Ph.D.



# Plans for the future

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- Slicer 4
- Qt and Numpy
- The Common Toolkit (CTK)



# Acknowledgements

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## **National Alliance for Medical Image Computing**

NIH U54EB005149



## **Neuroimage Analysis Center**

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