



Advanced Software Engineering

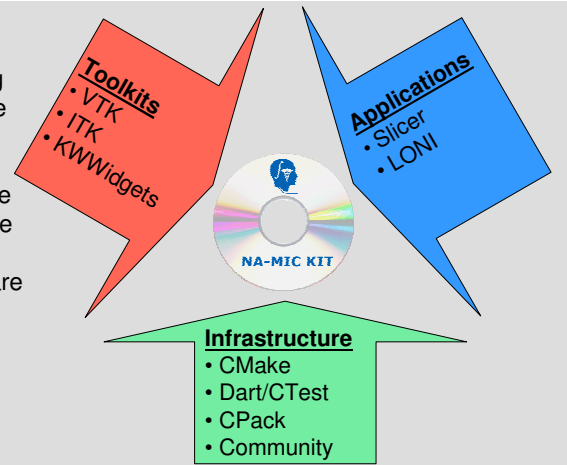
National Alliance for Medical Image Computing

William Schroeder, Ph.D.[§], Andy Cedilnik[§], Sebastien Barré, Ph.D.[§],
William Lorensen[‡], James Miller, Ph.D.[‡], Daniel Blezek, Ph.D.[‡]

[§]Kitware Inc., Clifton Park, NY,
[‡]GE Global Research, Niskayuna, NY

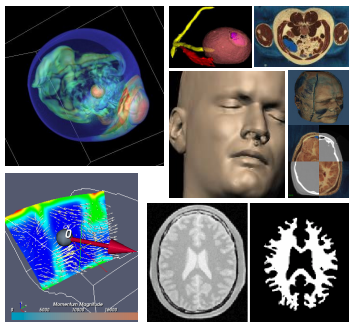
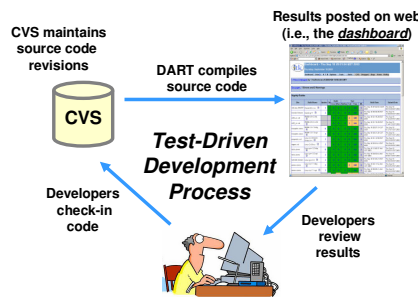
Overview

Medical image computing researchers often face the problem of moving promising algorithms from inception to clinical application. Algorithm developers lack the time and resources to engineer their code for robustness and compatibility, while end-users are anxious to try new techniques but require well designed and tested user interfaces to make practical use of them. The NA-MIC Kit is a collection of software and methodology specifically designed to address these problems and facilitate the rapid advancement of the field. It consists of three major types of software technology: programming toolkits (e.g., VTK and ITK), end-user application software (e.g., Slicer, LONI), and system infrastructure (e.g., CMake, CPack, DART). In addition, the NA-MIC Kit addresses issues of usability, software process including quality assurance, community building and licensing. These technologies are integrated in a consistent framework that facilitates the transition of ideas to usable, quality software implementations.



System Infrastructure

The NA-MIC Kit depends on the practices of agile programming and test-driven development to produce robust, high-quality software. DART and CMake/CTest form the core of the testing process. DART is a testing server, posting test results from around the world on a web server. CMake/CTest are used to control the build and test process, and report results to DART. Other tools such as CVS and SVN for version control, Doxygen, email lists, wikis, and bug trackers help build strong community collaboration.



Programming Toolkits

Toolkits provide the basic components with which applications are built. Using object-oriented and generic programming approaches, users and developers can rapidly assemble compelling biomedical imaging applications. The Insight Toolkit ITK provides imaging, segmentation and registration capabilities. The Visualization Toolkit VTK provides advanced rendering, interaction and modeling capabilities including volume rendering. KWWidgets provide high-level GUI tools.

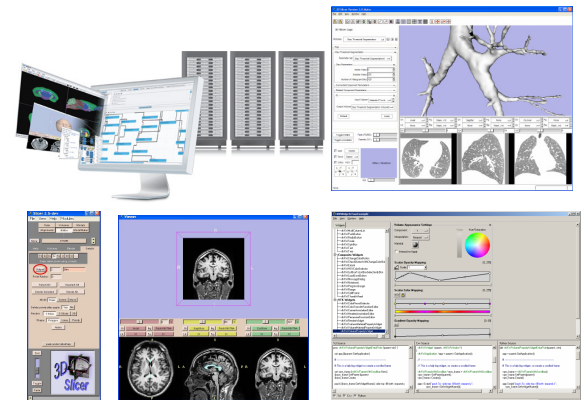


NLM Insight
Segmentation & Registration Toolkit



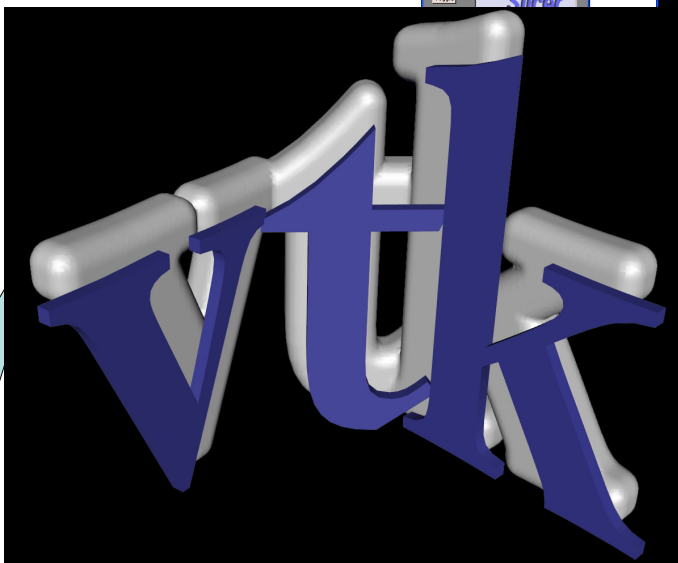
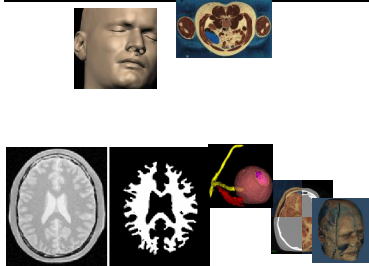
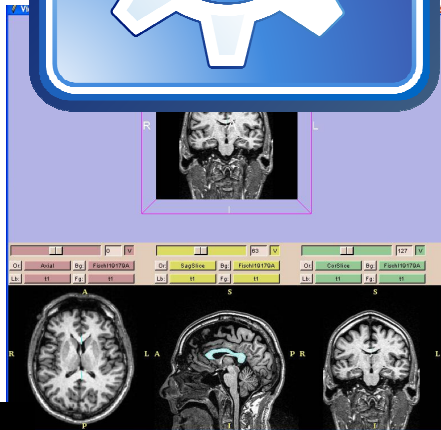
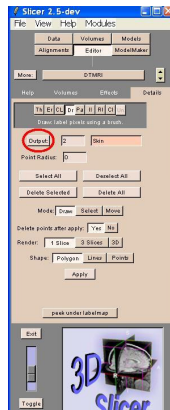
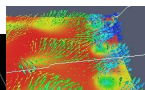
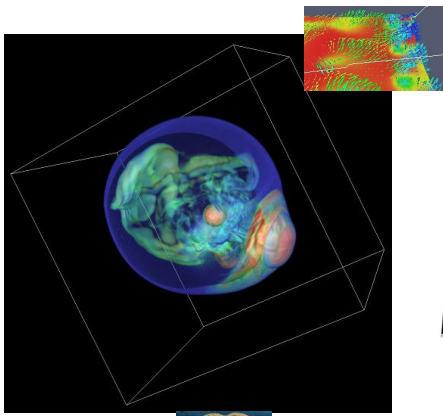
End User Applications

Most researchers prefer turn-key applications to programming custom solutions. Slicer3 is the next generation end user application for neuroscience and image guided therapy. Slicer3 is an open source, cross-platform applications for exploring novel image analysis and visualization techniques, supporting registration, segmentation, 3D model generation, quantification and real-time integration.



Support

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User Interaction

- LONI
- KWWidgets
- Slicer

Software Tools

- CMake

