Prototyping and Algorithm Integration in Medical Visualization



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- Prototyping
- Visual Programming Platforms
- Requirement Analysis
- Levels of Integration
- Prototyping Example

Prototyping in Medical Visualization

Innovation in medical visualization requires close collaboration between...



Prototyping serves as a common language

Algorithm Prototyping for Medical Environments

Clinical users

Research

- variable scenarios
- »expert« parametrization
- fast changes
- little testing

Clinical use

- efficient workflow
- easy handling
- standardization
- stable execution

Prototyping platform should provide commonly required features

Visual Programming / Prototyping Platforms

- AVS Express
- Amira
- DeVIDE
- SCIRun
- MeVisLab



Algorithm Prototyping for Medical Environments

- Import and export of medical image data (DICOM)
- Coherent visualization of data in 2D and 3D
- Interaction support in 2D and 3D
- Combined Volume and Surface Rendering
- Powerful imaging and graphics frameworks that interact
- GUI building support, scripting to add dynamic behavior





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Integration at different levels

- Iow-level (Module level)
 - High performance implementation of core functionality
 - Build on powerful frameworks
- medium-level (Network level)
 - Combine low-level algorithms to form complex algorithms visually
 - Build on a rich algorithm library
- high-level (Application level)
 - Design and build user interfaces
 - Hide network complexity

Prototyping a Small Filter Application

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Algorithm Prototyping for Medical Environments



- Visual prototyping facilitates the communication between clinical users, researchers, and developers
- Using a prototyping platform accelerates the exploration of algorithms in clinical settings
- Leveraging the powerful base functionality allows you to concentrate on your own innovative concepts