

Music 120: Introduction to Audio/Multimedia App. Programming

Week #4 - 10/16/2006
CCRMA, Department of Music
Stanford University

Last Week...

- Stk programming examples
 - preprocessor
 - callback function
 - Stk instruments / effects
 - error handling
 - stereo
 - multiple effects / instruments
- Note: correction on `ex7.cpp`

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Today...

- IDE: Xcode
- VST plug-in
- Audio Unit
- Max/MSP plug-in

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IDE

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IDE

- Integrated Development Environment
- Software that assists programmer to develop software
- (Usually) contains...
 - editor
 - compiler
 - debugger
 - GUI designer

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OS X IDE: Xcode+ α (a.k.a. Dev. Tools)

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Developer Tools

- Part of OS X package
 - <http://www.apple.com/macosx/developertools>
 - <http://developer.apple.com/tools/>
- Xcode
 - editor + compiler + debugger + ...
 - <http://www.apple.com/macosx/features/xcode>
 - <http://developer.apple.com/tools/xcode/>
- GUI design: Interface Builder

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VST

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VST...?

- *Virtual Studio Technology* by Steinberg
- Debut: 1996 (v 1.0)
 - audio processing units (a.k.a. effects)
- Current: v 2.4
 - virtual synths (VSTi) since v 2.0
- Based on plug-in architecture

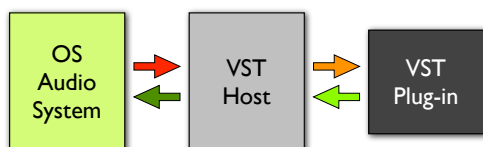
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Plug-in

- A small child program
 - designed to alter, enhance, and/or extend the operation of its parent program (host)
 - seen as a black box from its host
- VST plug-in & host
 - plug-in: effects and/or synths
 - host: interface & service

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Host & Plug-in



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Why Plug-in?

- DSP-only (well, almost...) programming
 - can concentrate on the core algorithm
- NO
 - system-level audio handling
 - GUI-design
- Dynamic library
 - multiple instances can run simultaneously
 - usable with multiple VST hosts

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VST SDK

- Steinberg 3rd party dev. page
 - http://www.steinberg.net/324_1.html
- Version 2.4
- Contains...
 - source codes
 - IDE projects (Xcode & VS)
 - simple utilities
 - documentation

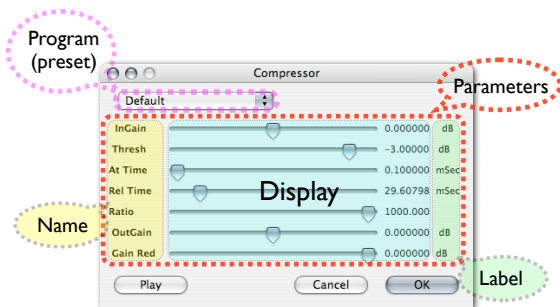
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Key Concepts

- Polymorphism
 - inherit & override base classes
 - AudioEffect (v 1.0) / AudioEffectX (v 2.x)
- Callback (again): processing
 - process <- deprecated in v 2.4.
 - processReplacing
 - processDoubleReplacing

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Example: Comp.



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Methods

- Program
 - getProgram / setProgram
 - getProgramName / setProgramName
- Parameters
 - getParameter / setParameter
 - getParameterLabel
 - getParameterDisplay
 - getParameterName

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Methods (cont'd)

- Plug-in properties
 - getEffectName
 - getVendorString
 - getProductString
 - getVendorVersion

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