Music 120: Introduction to Audio/Multimedia App. Programming

Week #4 - 10/16/2006
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Last Week...

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

Today...

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

IDE

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

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

- Part of OS X package
- Xcode
  - editor + compiler + debugger + ...
- GUI design: Interface Builder

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

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

Host & Plug-in

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
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

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

Example: Comp.

Methods

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

Methods (cont’d)

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