Think outside the box: Custom Development with Autodesk Entertainment Creation Suite

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A little bit more about me:

- Emmy award winner for VFX supervision on the critically acclaimed LOST plane crash
- Autodesk Certified Expert and Training Specialist for over 11 years
- Teacher of 3ds max, maya, motionbuilder, mudbox, softimage, …
- President of the Montreal 3ds max User Group
- Autodesk Master nominee
- Author of several CG books
- 3ds max user and developer for more than 15 years
- President of Di-O-Matic
Di-O-Matic Products Line

Superior Character Animation Tools in Autodesk Products

1. Automatic Lip Synchronization
   Voice-O-Matic
   3ds max, maya, softimage, flash

2. Automatic Facial Modeling
   Facial Studio
   Windows, 3ds max

3. Automatic Facial Animation
   Maskarad
   Windows, MotionBuilder

4. Specialized Character Animation tools
   Muscles, Morphing, …
   3ds max
Learning Objectives

At the end of this class, you will be able to:

- Identify the programming languages that can be used to extend Autodesk products
- Maximize customization capabilities in Autodesk 3D products
- Rapidly start a customization project for Autodesk software that is available in the creation suites
- Identify the programming area to focus on, based on needs and the production platform
Autodesk Entertainment Creation Suite

Similar to Microsoft and Adobe suite offering, but for 3D

Now only 8395 $, 6 years ago: more than 145 000 $!

- 3ds max
- Maya
- MotionBuilder
- Mudbox
- Softimage
  - Including ICE and FaceRobot

- But also:
  - Mental Ray, Backburner, Composite, …

http://usa.autodesk.com/adsk/servlet/pc/index?id=13420613&siteID=123112
Customization

The true power of all Autodesk products!

No one is actually using the products as is.

Customization Types
- Shortcuts and UI
- Scripts
- Plugins

Think outside the box: There is NO box!
Custom Tools Examples

- City Generator
- TurboReverse
- FaceRobot
- Face Machine
- Voice-O-Matic
- Muscles
- People Power
- Genome
Evolution of Autodesk Products over the recent years

- Tight integration of commercial plug-ins into the core
- Many tools available today started as external tools
  - Character Studio
    - Biped
    - Physique
    - Crowd
  - ClothFX aka Stitch
  - Shave and Haircut
  - ProBoolean & ProCutter
  - Mental Ray
  - ProSound
  - Substances

- Same in other Autodesk product including Maya and Softimage
  - Muscles, faceRobot, Syflex, Lagoa
Autodesk 3ds max 1/3

- Third Party History
  - Very large plugins community

- CORE
  - Modifier Stack, Controllers, Time Control, Viewports
  - Plugins (900+ ships with 3ds max)

- What can be extended?
  - IO, modifiers, primitives, rendering, materials, lights, animation tools,
  - space warps, particles, controllers, lights, cameras, utility, audio, atmospheric, …

- Solely for Windows
Autodesk 3ds max 2/3

- MAXScript
  - Quick History
  - Fundamental Architecture: Scripting was an after thought
  - Unique logic and syntax
  - Backward / Forward compatibility issues
  - Visual MAXScript
  - Scripts vs Plugins
  - Run vs Compiled
  - Execution Speed
  - Code Length
    - Protractor
      - C++ : 787 lines
      - MAXSCRIPT : 50 lines
  - Hybrid tools
Autodesk 3ds max 3/3

- **SDK**
  - 80% of 3ds max are plugins and 80% of these plugins source code is available
    - C++ Plugins
    - Same SDK used by 3ds max team
    - Backward / Forward compatibility issues

- **.NET**

- **Python & Qt**
  - unofficial via Py3dsMax

- Backward / Forward compatibility issues
Autodesk Maya 1/2

- CORE

- Cross Platform
  - OSX
  - Linux
  - Windows

- Fundamental Architecture
  MEL from the ground up
  UI on top
Autodesk Maya 2/2

- MEL script
  - Unique logic and syntax
  - Backward / Forward compatibility issues

- Qt
- Python

- API
  - Abstraction Layer
  - C++ Plugins
  - Backward / Forward compatibility issues
Autodesk Softimage 1/2

- Fundamental Architecture
  Standard scripting languages from the ground up

- Script languages
  VBScript
  JScript
  Python

- API
  C++ Plugins
  C#
  .NET
Backward / Forward compatibility issues
Autodesk Softimage 2/2

- Interactive Creation Environment (ICE)
  - Visual Programming Flow
Autodesk MotionBuilder

- History

- Fundamental Architecture
  - Scripting was an after thought
  - FBX file format as core

- Python

- API
  - C++ Plugins
  - Backward / Forward compatibility issues
Autodesk Mudbox

- History
- SDK, C++
- Qt
- OSX/Windows

- Plugins Type
  - SubDivision
  - Viewport Filters
  - Importer/Exporters
  - Brushes
Autodesk FBX 1/2

- History
  - Initially developed by Kaydara to allow inter-operability with MotionBuilder and other 3d applications.
  - Supported by all major 3d applications in import and export.
  - Support many advanced features like morphing, materials, lights, multiple UV, constraints and much more…
Autodesk FBX 2/2

• Allow mixed pipeline
  Autodesk Products
    3ds max, Maya, MotionBuilder, Mudbox, Softimage

• With FBX developer Partners
  Unity 3D
  Daz 3D
  Di-O-Matic

• FREE SDK
  Benefits
  Free source code
  Available on [autodesk.com/FBX](http://autodesk.com/FBX)
  Compatibility Charts
Types of Tools

- One-liner
- Prototyping
- Proprietary
- Commercial

Many tools available in Autodesk products today started as external tools such as Biped, CAT, Muscles, faceRobot, …
Is it there already?

- Are you sure someone did not had that problem before?
  - Script spot
  - Creative crash
  - The Area
  - Maxplugins.de

- Frustration of coding something already present
Protect your IP

- Free or not?
- Compiled, commercial, encrypted
- Licensing
To Sum it up

- API vs. SDK
  - C++, .NET
- Scripts languages
  - MEL, MAXScript, Python, VBScript, JScript
- Protect your code
Learning Objectives

BY now, you should be able to:

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