

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

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# Laurent M. Abecassis

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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# Q&A

