# [Rigging & Pipeline Tools]

[A FEW EXAMPLES OF TOOLS I WRITE] HARSHAD BARI

## **Creature Rigging Framework**

## (Ongoing Personal project)

This project is an ambitious personal undertaking of mine to learn, create and achieve. I have been working on developing this in my free (non-studio-work) time for the past 2 years.

- Creature Rigging Framework is based on the component-based approach from CultOfRig. The Goal of my system is to help build structured modular components with set contract rules.
- The first prototype is completed. This milestone included writing an extensive core component class, a working visual editor, basic components and decoupled interaction with Maya with Qt Signals.
- Maya API is used extensively.



## **Edge Styles**





## **Component Types**

# Prop Setup Tool (mGear)

## Purpose:

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-- A Tool for environment artists to create Rigs for simple objects in a scene with controllers.

## Features:

- Control shape & size selection
- Custom Parent Hierarchy and organization.
- Ability to Rebuild Rig (data is saved in scene to allow it).
- Create multiple offset controls.

M Prop Setup Tool	– 🗆 🗙
PROP SET	TUP TOOL
Create R	ig Global
Control Shape	
Circle 🔻 🛛	
Custom Name: Custom Name	
Custom Parent: Parent Input/S	
Align to World	Offset Controls: 0 🗧
Create Guide(s) (Selection)	Delete Guide(s) (Selection)
✓ Perform Constraint	Delete Guide after Build
Build Rig	Delete Rig
Global Constraint (Selection)	Store Controller Shape
geo   all	Delete Main Guide

#### **Rotation Composer**



#### Purpose:

-- Used for Joints mainly. Composes joint rotation to rotate, jointOrient or rotateAxis

#### Features:

Using Quaternion matrix of joint, extracts the world Rotation & sets it to desired attributes. (Zeroing others)
Very useful tool during rigging to move rotation values to rotate/rotateAxis/jointOrient without offsetting the joint.

## **Selection Handler**



## Purpose:

-- Store selections in PySide2 QWidget buttons.

#### Features:

- -- Saves current selection for later use.
- -- Button shows number of objects in the selection.
- -- Works with both objects and components.
- -- Tool supports add/subtract/toggle selection same as Maya default:
- Ctrl: Subtract selection
- Shift: Toggle Selection
- Ctrl + Shift: Add Selection

#### Character Data Manager

#### Purpose:

-- Manages character specific export data files (SkinCluster, Deformers, Shapes, MEL, JSON files) through a convenient UI.

## Features:

- -- Based on an existing version system, auto versioning for exported skin/deformer weight files.
- -- Navigate Project structure easily using dynamically created buttons.
- -- Filter files based on extension. Different extension allows context specific import export functions.

-- Filter search files.

-- Context menu for import or execute currently selected file(s).

Character Data Manager 🧧	1
CHARACTER DATA MANAGER	
Project: body facial hair publishGuide Data: SHAPES blendShape skin	
Search:     Filter by Filename     Clear       Extension:     • .gSkin     • .xml     • .ma/.mb     • .mel       • .json     • All     • Custom     ext	
<ul> <li>eyeball_geo_L.gSkin</li> <li>eyeball_geo_R.gSkin</li> <li>eyebrow_geo_L.gSkin</li> <li>eyebrow_geo_R.gSkin</li> <li>eyeHighlight_geo_L.gSkin</li> <li>eyeHighlight_geo_R.gSkin</li> <li>eyelash_geo_DL.gSkin</li> <li>eyelash_geo_UL.gSkin</li> <li>eyelash_geo_UR.gSkin</li> <li>eyelash_geo_UR.gSkin</li> <li>eyelash_geo_UR.gSkin</li> <li>eyelash_geo_UR.gSkin</li> <li>eyelash_geo_UR.gSkin</li> <li>eyelash_geo_UR.gSkin</li> <li>eyelash_geo_UR.gSkin</li> <li>eyelash_geo_UR.gSkin</li> <li>eyelash_geo_UR.gSkin</li> <li>eyeShadow_geo_R.gSkin</li> <li>gum_geo_D.gSkin</li> <li>gumB_geo_U.gSkin</li> <li>gumB_geo_U.gSkin</li> <li>hair_geo.gSkin</li> </ul>	<ul> <li>jacket_bs.json</li> <li>jacket_bs.ma</li> <li>shirt_bs.json</li> <li>shirt_bs.ma</li> <li>skin_bs.json</li> <li>skin_bs.ma</li> <li>Import Maya Scenes</li> <li>Import Controls Shape Data</li> <li>Code</li> <li>Import BlendShape Data</li> <li>Code</li> <li>Import Facial Data</li> <li>Code</li> <li>Source MEL Files</li> <li>File</li> <li>Backup File</li> <li>Restore this Version</li> </ul>
bairOutling and aSkin     Open Directory     Refresh Directory	Open Directory Refresh Directory
Export Skins (Scene Selection) .gSkin Update Maya Scene	

#### **CREATURE SKIN TOOLS**

#### Purpose:

-- My Swiss-Army of Skin-Tools that I am continuously developing for fast personal workflow.

#### Features:

**UI Features:** 

- -- Consistent Tool Settings. Settings are exported to INI format and restored on initialization.
- -- Focus on smart grouping of tools to increase speed of workflow.
- -- Three Tabs separating TransferSkin, CancelSkin(BindPreMatrices) & Skin Exporter/Importer.

#### Transfer Skin:

- -- Transfer SkinCluster from first selected object to all destination targets.
- -- Joints list is queried from source and targets are automatically skinned to source joints.
- -- Skinning can be transferred using name-matching (Search & Replace).
- -- All above functions are supported with mirror name matching. E.g. Transfer skin from left to right.



Continue on next page...



## Cancel Skin.

-- Add joints to UI List. Cancel Skin will connect joint parent's (user specified level) bindPreMatrix to skinCluster.

-- Convenient option to restore and remove all bindPreMatrix connections.

Used for on-surface controls. E.g. Facial Rigging.

## Todo:

-- Split-pane UI showing all influences (left) and canceled influences(right).

## Import Export Skin:

🔣 CreatureSkinTools				×
Transfer Skins				
Cancel Skins				
Import Export Skins				
Quick Export W		Quick I		
C:/Users/Harshad/Docum	nents/creature_v	veights		
Operations:	Name		<ul> <li>Date Modifie</li> </ul>	d
	ig pSpher	e1.0001.crw	6/5/2019 12:1	9 AM
Export	ig pSpher	e2.0001.crw e3.0001.crw	6/5/2019 12:1 6/5/2019 12:1	9 AM 9 AM
Import Options: X Prefix:				
Inf Prefix				
🗶 Suffix:				
Inf Suffix				
🕱 Search/Replace:				
Inf Search				
Inf Replace				
Method:				
Barycentric 🔻				

## Features:

-- Core functions written in Maya Python API.

-- Exports skinfiles for all selected objects to separate files.

- -- Select Geometry/Joints from skinFile.
- -- Create/Rename folders and skin files.
- -- Export skinfiles to specified directory.

-- Ability to batch import all skin files from specified folder. #Organization

-- Import Skin to different joints based on influence name search/replace, prefix, suffix.

## Todo:

-- Import skin weights in world space using barycentric coordinates.



M Creature Namer	– 🗆 🗙
BATCH RENAME	
Naming	
Prefix ren Suffix	ren
Type O- New Name 0	Auto
Search Replace	
• Selected O Hierarchy O Swap	
Search Replace	ren
Prune Shapes Rename	
Remove 0 🔮 Characters 🗆 From Back ren Sel si	
Remove 0 🗢 to 0 🗢 Characters ren All sh	
CUSTOM RENAME	
Nothing selected.	



## Purpose:

- -- A tool to help fast rename objects with various options to improve Rigging time efficiency.
- -- Custom rename a list of objects

#### Features:

Batch Rename:

- -- Supports Prefix, Suffix, New Name with Auto Padding.
- -- Search/Replace working with Selected, Hierarchy and All.
- -- Swap Rename, useful for mirrored objects or prefix/suffix replace.

#### Custom Rename:

-- Load multiple objects to list and rename manually

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## PUBLISH CAMERA



#### Purpose of this tool:

-- A tool to export/import Shot Camera stored on a central project directory.

-- User(Artist) has to select the Project, sequence, shot.

#### Features:

Exporter:

-- Camera will be exported to the specific shot/cam folder as "currentFileName\_cam.ma"

-- Bake camera and export it with camera-specific information.

Importer:

- -- Reference the master/variant camera based on user input
- -- Set the scene time range from camera.

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#### PUBLISH SHADING NETWORK



## Purpose of this tool:

--A standalone tool to export/import Maya shading networks to an external file. (Path of this file can be set later at a studio level but right now its user-dependent).

--When exporting, the tool also saves object assignment to the shader node. So when importing, it will assign automatically to the objects (if object is present in scene).

--Options are described in the below image.

-- This tools also works well together with the create\_ass\_standins tool (see below)

#### Features:

Utility to export shaders to external file.

**Export Function:** 

- Takes current selection & exports shader with object assignment information. Import function:

- Bring in the external shader file (previously exported).
- Checks the shading assignment on the shader.
- If the object exists in the scene, assigns the shader to the object.

# **EXPORT/CREATE ARNOLD STANDINS (.ass)**

# Purpose:

Utility to export Geometry as Arnold stand-ins (.ass files) -- Option of per object or per shading group.

maya maya			
Utility to export arnold . with the option of per ot shading group.	ass files ject or per Heln windo	Objects exported pe shading group looks this:	r like all_props1SG.ass.gz all_props2SG.ass.gz all_props2SG.asstoc all_props3SG.ass.gz
		vv	all_props3SG.asstoc
Expert Area	Create Ass Standins	x	<ul> <li>all_propsSG.ass.gz</li> <li>all_propsSG.asstoc</li> <li>alSurface1SG2.ass.gz</li> <li>alSurface1SG2.asstoc</li> </ul>
Export Area	CREATE A	SS STANDINS	alSurface2SG.ass.gz
Export Path (Folder path to export .ass.gz files)	Export Ass Files		alSurface2SG.asstoc         circuitBox_alSurface1SG.ass.gz         circuitBox_alSurface1SG.asstoc
Do you want to export .ass by per object or per shading group???	Export path to store ass file	-s Per Shading Group To Given Folder) Browse	<ul> <li>concreet_alSurface1SG.ass.gz</li> <li>concreet_alSurface1SG.asstoc</li> <li>concreet_alSurfaceSG.ass.gz</li> <li>concreet_alSurfaceSG.asstoc</li> </ul>
Export Button to execute	L	A)	When objects exported
Create Area Import Path (Folder containing .ass or .ass.gz files) Create Arnold StandIns button to execute	Create Standins Import path to ass files Create Standins (From /	ss Files in Given Folder) Browse Browse to folder	per object looks like this: towers36.ass.gz towers36.asstoc towers38.asstoc towers40.ass.gz towers40.ass.gz towers40.asstoc woodenBlocks01.asstoc woodenBlocks01.asstoc woodenBlocks03.asstoc woodenBlocks03.asstoc woodenBlocks03.asstoc woodenBlocks03.asstoc
			\sub woodenBlocks08.ass.gz

# **CREATE ALEMBIC STANDINS**

## Purpose:

Given an Alembic file, the tool will read the contents and allow the user to create Arnold stand-ins in the current scene.

## Features:

- -- Read contents of Alembic file and display filtered Geometry results.
- -- User can pin specific geometries from Alembic file to create stand-ins for it.
- -- Support multiple alembic files.

CreateArnoldStandins	- u >
lembic Files to Process:	
E:/Maya/FabricEngine-2.3.0-Windows-x86_64/Resources/frog.abc	• • • •
/lowXfo	*
/lowXfo/low	<b>X</b>
/CameraXfo	<b>X</b>
/CameraXfo/Camera	<b></b>
Create Arnold StandIns	Close