Create Storyboards to Short Animated Films with Autodesk Maya

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Autodesk, Designated Specialist

Learning Objectives

- Learn how to generate animations from simple 2D visual drawings
- Explore advanced tools and high-end plugins in Maya
- Generate simple characters to enhance your short-animated films
- Implement custom workflows to enhance your short film with music and special effects

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Description

There is a need for digital artists to generate animations from their 2D visual drawings. Further, they also want to enhance the short films with music and additional effects. In this class, we will learn how to create storyboards to short animated films in Autodesk Maya, using advanced tools and high-end plugins, to bring to life realistic 3D art, 4D animations or add to your design portfolio. If you are seeking more inspiration, then this class is for you - We will discuss a few examples to help you get to grips with its core Maya features, and supercharge your skills!

Viveka Devadas is a Design Technologist and Designated Specialist for AEC/VR products at Autodesk who helps customers adopt advanced visualizations and Extended Reality VR/AR/MR solutions into their everyday design workflows. She is a trusted advisor for enterprise priority customers and helps in minimizing downtime by troubleshooting specific issues. She networks with students, architects, designers, the global Autodesk product team, and the Revit community worldwide. With a background in Project Management, Digital Architectural Design and Construction Management, her journey into the AEC industry as a Project Architect, EU exchange Scholar, Designer, BIM -VDC Coordinator has been rewarding. It has been a creatively challenging experience and she comments that it continues to be fun every day!

Inevitably, it was a process of discovering her passions in advanced interactive visualizations - especially the VR/AR/MR industry, and she continues to explore design challenges that are innovative, environment-friendly and cost-effective that constantly evolve how we connect globally, 24x7, with people, information, data and experiences!

Contents

What should every Designer's Toolset® contain?

Whether you are the most accomplished professional who've outshined all levels of the visual effects and animation or if you are an individual with a creative inclination or a student who is just getting started in their careers, the first thing you should start with is a Designer's toolset. Please start with a list. Choosing the right toolset is essential if you want to bring your ideas close to reality.

1. Sketch tools
2. Custom templates
3. Modelling tools (2D/3D)
4. Art/Image/Texturing tools
5. Lighting/ Rendering tools
6. Compositing/Special effects tools
7. Voice/Music files
8. 3D printers/ scanners/ cameras/ drones
9. VR/AR/MR tools + equipment

Why Autodesk Maya®

Create beautiful 3D models and stunning animations with Autodesk Maya.

- An industry standard for a large part of its 23-year lifespan, Autodesk Maya is a powerful 3D animation software used by industry professionals for high-quality visual effects and motion graphics.
- What's more is that you can create and navigate scenes before moving into texturing, lighting, animating, rendering and more.
- Additionally, Maya offers more advanced features such as complex character creation and rigging, skinning, motion graphics, animating with dynamics and MEL scripting.
- Maya is a 3D designers' favorite due to it customizable workspaces, allowing users of all skill levels to customize the software to suit their specific workflow.
- 3D modeling capability comes in Maya's polygon, NURBs, and sculpture modeling tools, plus a UV editing tool, but a baffling array of animation and rigging tools beyond pure modeling give it its edge.
- Some favor Maya's cached playback feature, which makes live viewing of animations a smoother and faster experience than had with other 3D modeling software.
- Recent updates include a new new-user experience that makes for a much softer landing, with gamified introductions to the software and key tools.



Award Winners that used Autodesk Maya®

For more than 25 years, since 1997, Autodesk Media and Entertainment tools have been integral to helping creative visionaries bring cinematic storytelling to the big screen.

- Maya's been used on every winning film - many **Best Visual Effects Academy Award winners** throughout the 2000s

- Awards went to films that used the software in their development and Autodesk Maya pioneers many **virtual filmmaking techniques** that are now making their way into leading feature films and games cinematics.

- Maya has been used to create graphics for many cinematic films with Pixar's Renderman, including the Academy Award winners, Monsters, Inc., The Matrix, Spider-Man, The Girl with the Dragon Tattoo, Avatar, Finding Nemo, Up, Hugo, Rango, and Frozen.
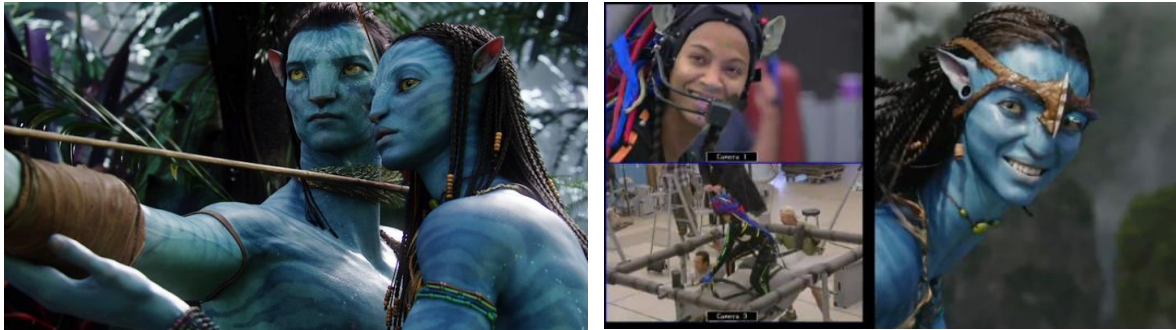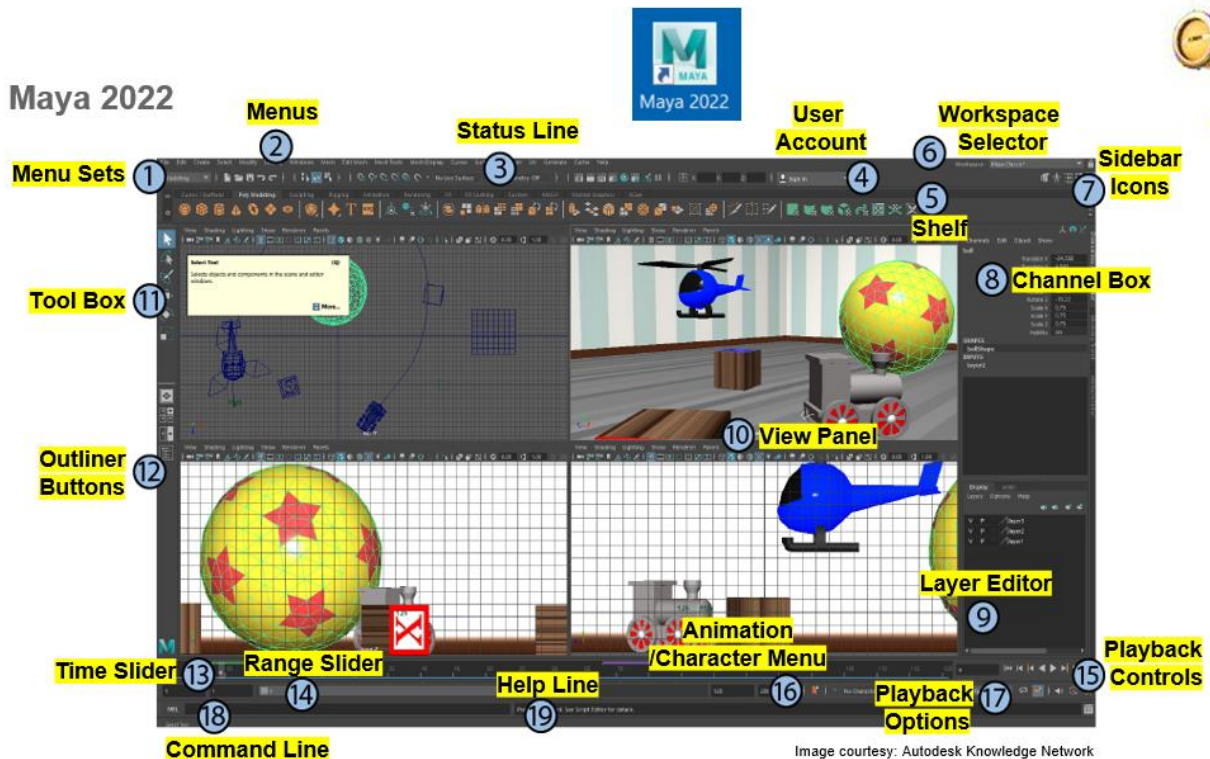

- It is also used to create visual effects for television programs, including Game of Thrones, The Walking Dead, Once Upon a Time, Bones, Futurama, Boardwalk Empire and South Park.

Interface overview

Image courtesy: Autodesk Knowledge Network
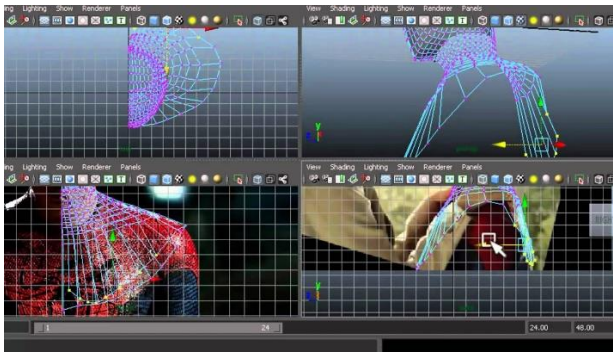
1. Menu Sets

Menu sets divide the type of menus available into categories: Modeling, Rigging, Animation, FX, and Rendering. Maya's first seven menus on the main menu are always available, and the remaining menus change depending on the menu set you choose. See Menus and menu sets for information.

2. Menus

The menus contain both tools and actions for working in your scene. The main menu is that the top of the Maya window. There are also individual menus for the panels and option windows. You can also access the menus in the main menu in the hotbox, which you can open by holding down the space bar in a view panel. See Menus and menu sets for information.

3. Status Line

The Status line contains icons for some commonly-used general commands, such as File > Save, as well as icons for setting up object selection, snapping, rendering, and more. A quick Selection field is also available for you to set up for numeric input. Click the vertical dividers to expand and collapse groups of icons.

4. User Account menu

Log in to your Autodesk account. Click for more options, such as to manage your license or purchase Autodesk products. Trial versions also show many days are left.

5. Shelf

The Shelf contains icons for common tasks, organized by tabs based on category. The real power of shelves, however, is that you can create custom shelves, and then make tools or command shortcuts that are quickly accessed from there with a single click. See Shelves for information.

6. Workspace selector

Select a custom or predefined arrangement of windows and panels designed for different workflows. Shown here is the Maya Classic workspace. For more information, see Workspaces.

7. Sidebar icons

The icons at the right end of the Status line open and close tools that you will use frequently. From left to right, the icons display the Modeling Toolkit, the HumanIK window, the Attribute Editor, the Tool Settings, and the Channel Box/Layer Editor (which is open by default and shown here).

In the Maya Classic workspace, these tools open as tabs in the pane below, except for the Tool Settings which open in a floating window. Use the tabs to switch between open tools, or click the current tab to collapse the whole pane. Click on any tab in a collapsed pane to restore it. You can also drag the tabs to change their order, or right-click on the tabs for more options.

8. Channel Box

The Channel Box lets you edit attributes and key values for selected objects. The Transform attributes are shown by default, but you can change which attributes are displayed here.

9. Layer Editor

There are two types of layers that are displayed in the Layer Editor:

- Display Layers are used to organize and manage objects in a scene, such as for setting their visibility and selectability.
- Animation Layers are used to blend, lock, or mute multiple levels of animation.

In all cases, there is a default layer where objects are initially placed upon creation.

10. View panel

The View panel offers different ways of viewing the objects in your scene with a camera view. You can show one or several view panels, depending on the layout you're using. You can also display different editors in the view panel. The Panel Toolbar in each view panel gives you access to many of the frequently used commands found in the Panel menus.

11. Tool Box

The Tool Box contains tools that you use all the time to select and transform objects in your scene. Use the QWERTY hotkeys to use the Select tool (**Q**), Move tool (**W**), Rotate tool (**E**), Scale tool (**R**), and Show Manipulators (**T**), as well as access the last tool used (**Y**) in the scene.

12. Quick layout/Outliner buttons

The upper three Quick Layout Buttons below the Tool Box let you switch between useful View panel layouts with a single click, and the bottom button opens the Outliner . See Panels and layouts for information on how to create custom layouts.

13. Time Slider (NEW!)

The Time Slider shows you the time range that is available as defined by the range slider, below. The Time Slider also displays the current time, the keys on selected objects or characters, the Cached Playback status line, and Time Slider bookmarks. You can drag the red playback cursor in it to "scrub" through animation or use the playback controls at the right end.

14. Range Slider

The Range Slider lets you set the start and end time of the scene's animation. You can also set a playback range if you want to focus on a smaller portion of the whole animation.

15. Playback controls (NEW!)

The Playback Controls let you move around time and preview your animation as defined by the Time Slider range.

16. Animation/Character menus

The Animation or Character menus let you switch the Animation Layer and the current Character Set.

17. Playback options

Use the Playback options to control how your scene plays back animation, including setting frame rates, looping controls, audio controls, auto keying, and Cached Playback, as well as giving you quick access to the Time Slider preferences.

18. Command Line

The Command line has an area to the left for inputting single MEL commands, and an area to the right for feedback. Use these areas if you are familiar with Maya's MEL scripting language.

19. Help Line

The Help Line gives a short description of tools and menu items as you scroll over them in the UI. This bar also prompts you with the steps required to use a tool or complete a workflow.

Customize the look and feel of the interface

You can adapt the user interface to your needs:

Here are some things that can be set up before you start on your project.

- To maximize your comfort levels – customize your background colors.

- For speed of working – hide non-relevant tabs.
- Customize file locations to enable easy access to templates and libraries.

- Customize your interface
    - Panels and Layouts
    - Change user interface resolution (scale)
    - Change user interface colors
    - Change the view panel background color
    - Color Settings
    - Customize the Time Slider
    - Change the length (scale) of normals in the display
    - Change working units from cms to inches
    - Change the operating language of Maya
- Customize how Maya works

- Customize shelves
    - To add a tool to a shelf

    - Select the tool.
    - Middle-drag the tool icon from the Tool Box onto the shelf.
    - **Tip:** You can add multiple versions of the same tool with different settings to a shelf. For example, you can add a Sculpt Surfaces Tool with the Push option selected and another Sculpt Surfaces Tool with the Pull operation selected. This only works with tools, not regular menu items (actions).

- Custom menu sets
- Customize Maya hotkeys
- Customize Search
- Customize ToolClips
- Customize marking menus / the hotbox
- Advanced customization

To change interface resolution

1. Open the Preferences window (select Windows > Settings/Preferences > Preferences).
2. Select the Interface preferences category, if it's not already selected.
3. Adjust the settings in the Interface Scaling section
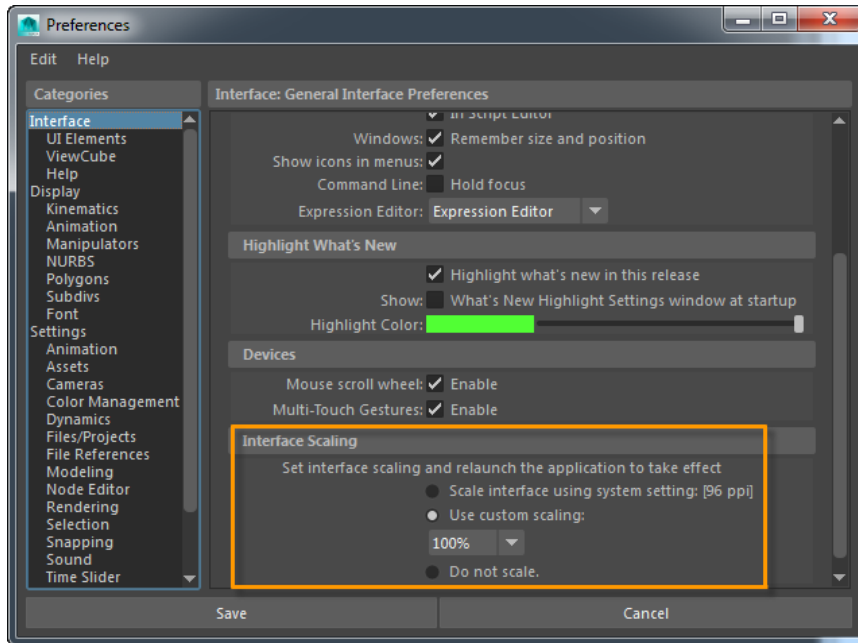
You can adjust the resolution (scale) of the Maya interface to take advantage of running on high resolution displays, like Ultra HD or 4K monitors, or Retina displays and tablets. The interface can scale to provide better readability of icons and text.

Note:
For Mac OS X operating systems running 4k monitors, the **Interface Scaling** section does not appear in the Interface Preferences:

- On Retina-enabled devices, Maya automatically uses the optimal display settings, therefore, the Use custom scaling setting is unavailable.

- If you are using a MacBook Pro (Retina) with a 4K monitor, your operating system version must be 10.9.3 or higher.

If the interface text is too small, try changing the **System Preferences** of your monitor. Look for the article **Adjust the resolution of your Retina display** on the Apple support website.

Programmatic customization

- The Maya interface is built using the Qt framework.
- You can create custom UI for Maya using Qt Designer. Qt Designer is available from the Qt Development Tools web site.
- Consult the Maya Open Source Components page for the version of Qt used by Maya.

You can load your custom UI into Maya using the loadUI command.

Panel Toolbar

The Panel toolbar, as shown in figure below is located just below the Panel menu of all viewports. This toolbar consists of the most commonly used tools present in the Panel menu.
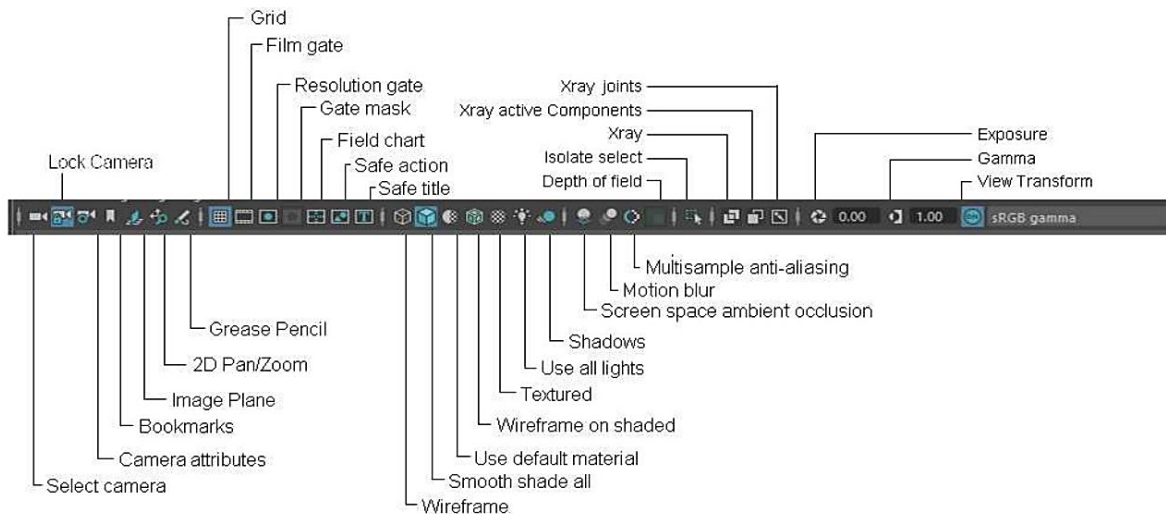
Navigating viewports

The perspective view is the default camera view in Maya. To look around in a scene, you can move the virtual camera associated with the viewport. You can use the following shortcut keys while navigating the viewport.

- ALT+Middle mouse button +Drag   Helps to pan the viewport
- ALT+Right mouse button +Drag   Helps to zoom in and out the viewport.
   (You can also use the scroll wheel to zoom in and out.)
- ALT +Left mouse button+Drag   Rotates or orbits the camera in the perspective window
- Ctrl + Spacebar   Full viewport view
- F   Center view on selected object
- **Hold Alt + LMB Click and Drag   (After center view – to rotate around selected object)**

Hotkeys

In Maya, you can create your own shortcut keys or even change default shortcuts.

To do so, choose **Windows > Editors > Settings/Preferences > Hotkey Editor** from the menu bar; the Hotkey Editor will be displayed, as shown in the figure below.

To edit hotkeys, select a hotkey category from the Edit Hotkeys For drop-down list. Now, find the desired command from the list displayed below the Edit Hotkeys For drop-down list.

Click on the command and then enter a keyboard shortcut.
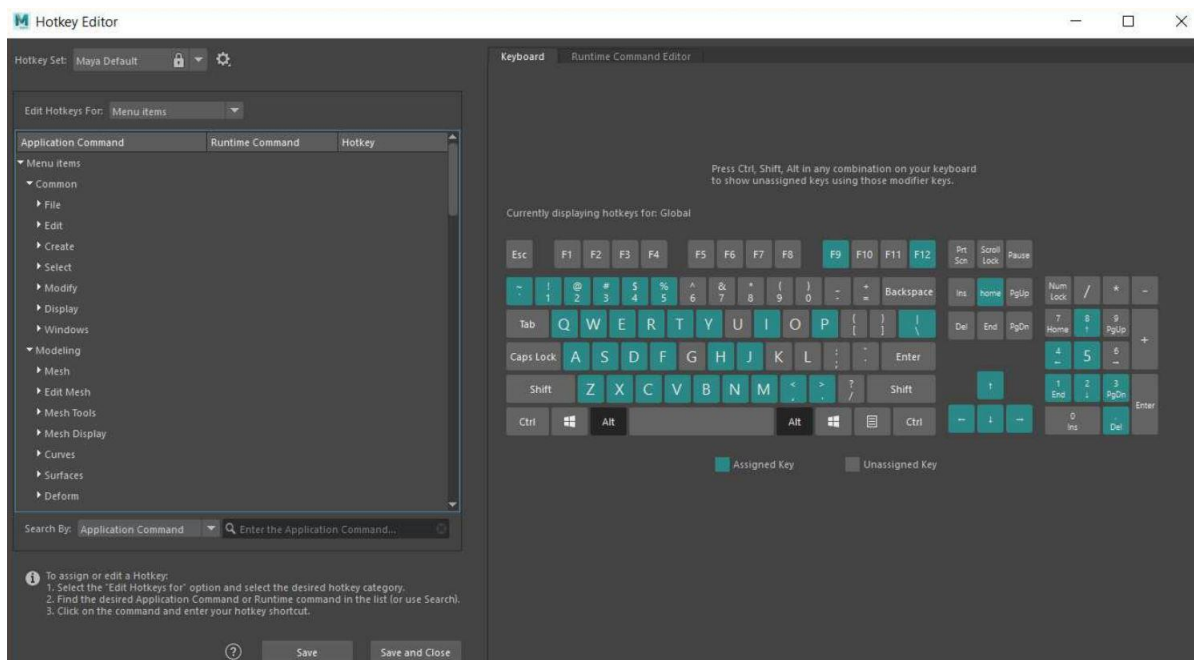
0	Default Quality Display	W	Move Tool, or with left mouse button for Move Tool marking menu	B	Modify upper brush radius (press and release)
1	Rough Quality Display				
2	Medium Quality Display	S	Set Key	Y	Selects the last used tool that is not one of Select, Move, Rotate, or Scale
3	Smooth Quality Display	X	Snap to grids (press and release)		
4	Wireframe	E	Rotate Tool, or with left mouse button for Rotate Tool marking menu	H	Hide/Unhide Current Selection
5	Shaded Display			N	Modify paint value
6	Shaded and Textured Display	C	Snap to curves (press and release)	J	Move, Rotate, Scale Tool snapping (press and release)
7	Use All Lights	R	Scale Tool, or with left mouse button for Scale Tool marking menu		
Q	Select Tool, or with left mouse button for Selection Mask marking menu	F	Frame Selected in active panel	M	Modify maximum displacement (Sculpt Surfaces and Sculpt Polygons Tool)
A	Frame All in active panel, or with left mouse button for History Operations marking menu	V	Snap to points (press and release)	I	Insert Keys Tool (for Graph Editor) (press and release)
		T	Show manipulator tool	L	Lock/unlock length of curve (press and hold)
		G	Repeat		
Z	Undo (also Ctrl+z/+z)			P	Parent

2D Pan/Zoom

🖱 \ + Middle mouse button	2D Pan tool
🖱 \ + Right mouse button	2D Zoom tool
\	Enable/disable 2D Pan/Zoom.

Animation Operations

I	Insert Keys Tool (for Graph Editor) (press and release)
S	Set Key
Shift + E	Set key for Rotate
Shift + R	Set key for Scale
Shift + W	Set key for Translate
Alt + J	Toggle Multicolor Feedback
🖱 Shift + S + Left mouse button	Keyframe marking menu

Displaying Objects (Show,Hide)

Ctrl + H	Hide > Hide Selection
Alt + H	Hide > Hide Unselected Objects
Shift + I	Isolate Select > View Selected (in the panel menus)
Ctrl + Shift + H	Show > Show Last Hidden
Shift + H	Show > Show Selection

Display Settings

0	Default Quality Display
1	Rough Quality Display
2	Medium Quality Display
3	Smooth Quality Display
4	Wireframe
5	Shaded Display
6	Shaded and Textured Display
7	Use All Lights

Edit Operations

Ctrl (or Cmd) + C	Copy
Ctrl (or Cmd) + X	Cut
Ctrl + D	Duplicate
Ctrl + Shift + D	Duplicate Special
Shift + D	Duplicate with Transform
Ctrl + G	Group
P	Parent
Ctrl (or Cmd) + V	Paste
Shift + Z	Redo
G	Repeat
Shift + G	Repeat command at mouse position
Z	Undo (also Ctrl+z/+z)

File Operations

Ctrl + R	Create file reference
Ctrl + Q	Exit
Ctrl + N	New Scene
Ctrl + O	Open Scene
Ctrl + S	Save Scene
Ctrl + Shift + S	Save Scene As

Hotbox Display

Space	(When pressed down) Show the hotbox

The Hotbox
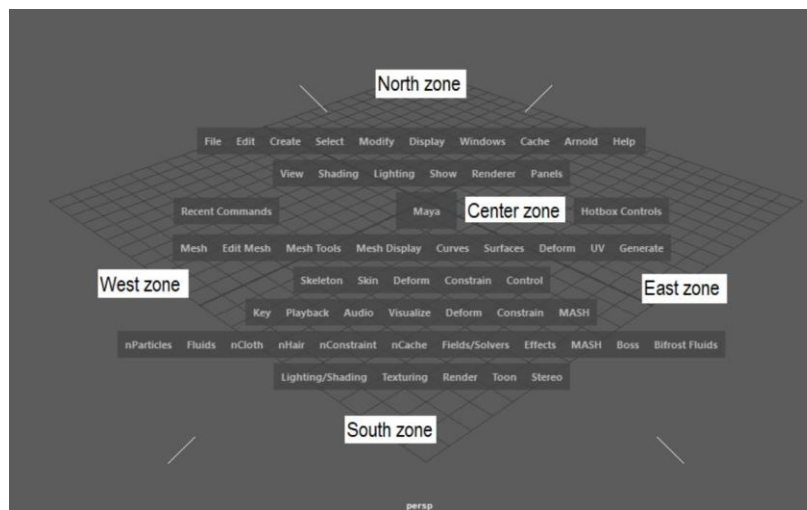
- Hotbox, as shown helps you access menu items in a viewport.
- The Hotbox is very useful, when you work in the expert mode or the full screen mode. It helps you access the menu items and tools by using cursor in the workspace.
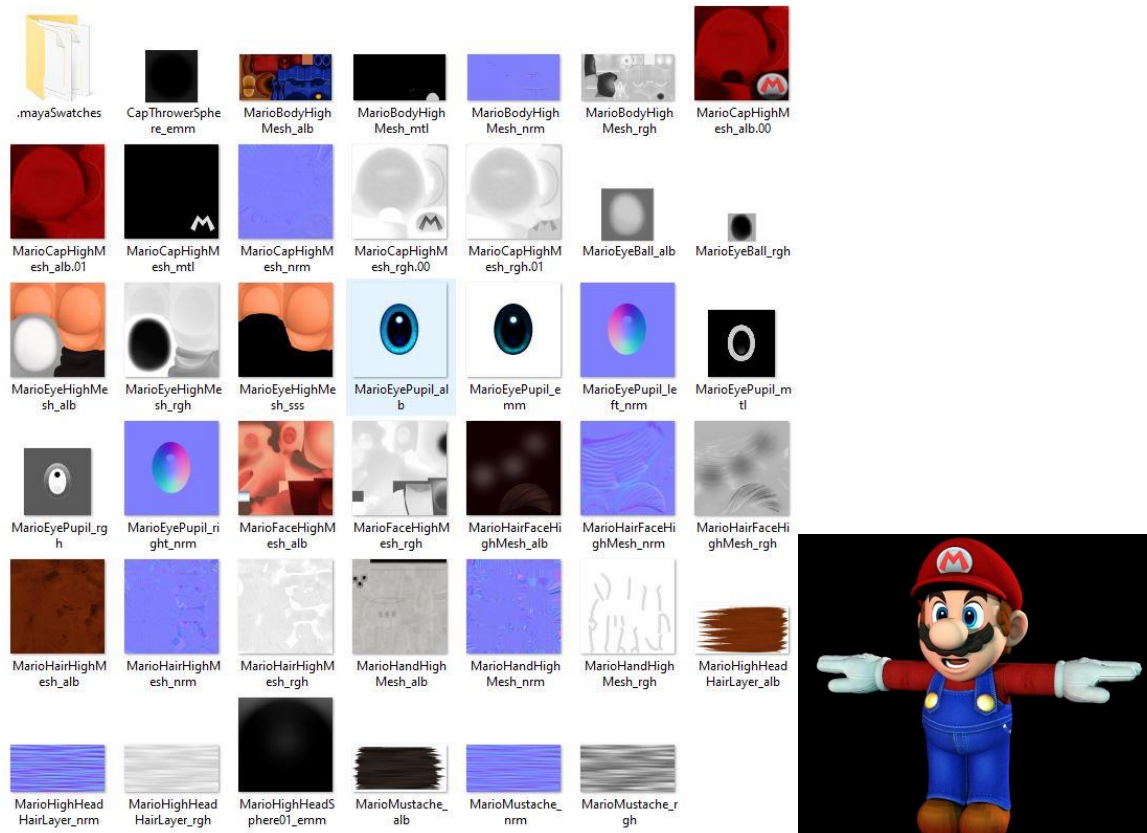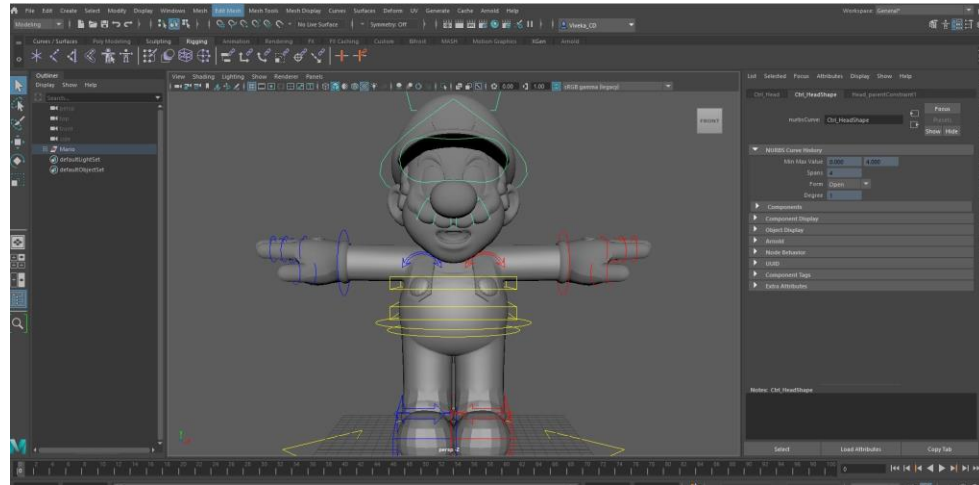- To access a command, press and hold the SPACEBAR key; the Hotbox will be displayed. Now, you can choose the option that you need to work from the Hotbox.
- The Hotbox is divided into five distinct zones, East, West, North, South, and Center

Learning Objective 1: Learn how to generate animations from simple 2D visual drawings

Learning Objective 2: Explore advanced tools and high-end plugins in Maya

Windows > Editors > Setting/Preferences > Plug-in Manager from the menu bar; the Plug-in Manager window will be displayed.

In this window, select the Loaded and Auto Load check boxes corresponding to the Extensions for different areas, that are used for interacting with external software

Plugins are available for:

- ▪ Crowd Simulation
- ▪ Dynamics
- ▪ Fluid
- ▪ Import/Export
- ▪ Modeling
- ▪ Rendering

BHGhost

This plugin takes it one step further, creating an onion skin that creates actual 3D outlines of your animation in the Maya viewport, making it easier to see the relation between poses and refine your animation even further.

Animbot

What's cool about Animbot is that it can streamline our animation – and can tweak one controller to adjust entire shot. if you wanted a character to look more screen left and you've been animating him looking screen right the entire shot, all of a sudden you can just tweak one controller and it will re-adjust everything to go left instead of having to tweak each individual controller manually afterwards.

24 frames cycle
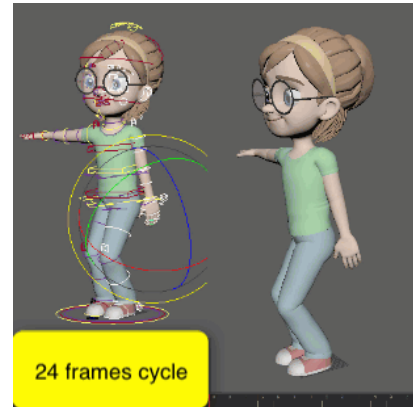
Yeti

Yeti is the industry's leading product to produce fur, feathers and generate a large number of items based around familiar working concepts of a procedural node graph directly within Autodesk's Maya.

Golaem Crowd

Integrated in Autodesk Maya, Golaem Crowd makes it easy and affordable to populate worlds with directable digital characters, from a few to thousands.

Shaders

Shader Pack

A work-in-progress production shading library for Arnold. It currently contains a surface shader and a few utility shaders, and the aim is to slowly build it into a full-featured production-quality shader library.

Kettle shaders

Kettle Shaders is Kettle Studio's in-house package of workhorse shaders and related utilities.

Shader Collection - Essential

The Shader Collection - Essential is a FREE shader collection for Arnold and other renderers. It includes shaders of various types. From simple helpers like a clamp range shader up to a advanced fractal or DOF shaders.

Oblique FX shaders

A large collection of shaders created by ObliqueFX for Arnold.

aaOcean Shader

aaOcean is an implementation of Jerry Tessendorf's 2004 paper on Simulating Ocean Waves.

Integrations

HDR Light Studio for Maya

HDR Light Studio is a powerful lighting tool for Maya and is fully compatible with Arnold. Light your shots using high dynamic range softboxes, spotlights and studio lights by clicking directly on your 3D model to position light sources. An HDRI map is generated for use in Arnold's sky dome. See the results in the Arnold interactive preview as you light.

Arnold Lightwave Plug-in

LWtoA is a custom plugin that integrates Arnold seamless inside Layout 11, with nearly all features suported by Arnold, including interactive rendering, all Arnold shading nodes, all Arnold lights, etc.
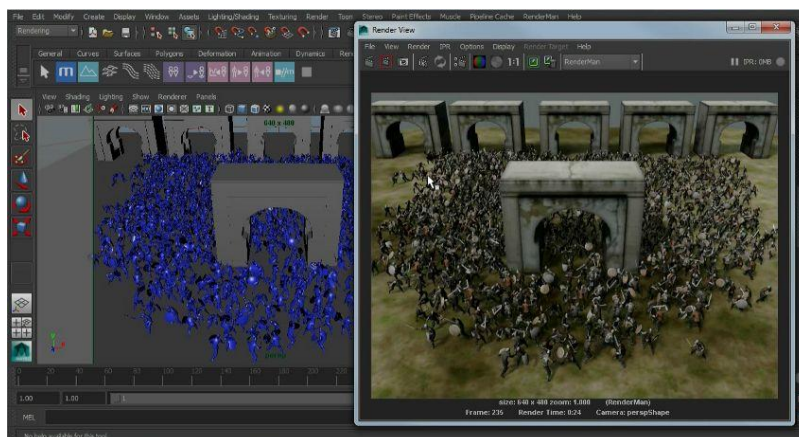
massive2arnold

massive2arnold is an arnold procedural that renders massive-generated rib files.

Massive for Maya – generates crowds
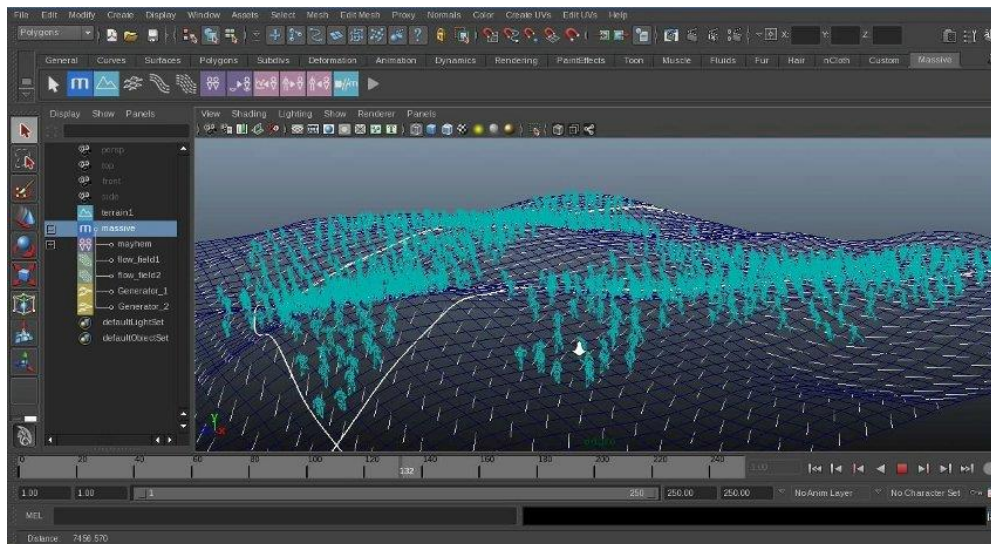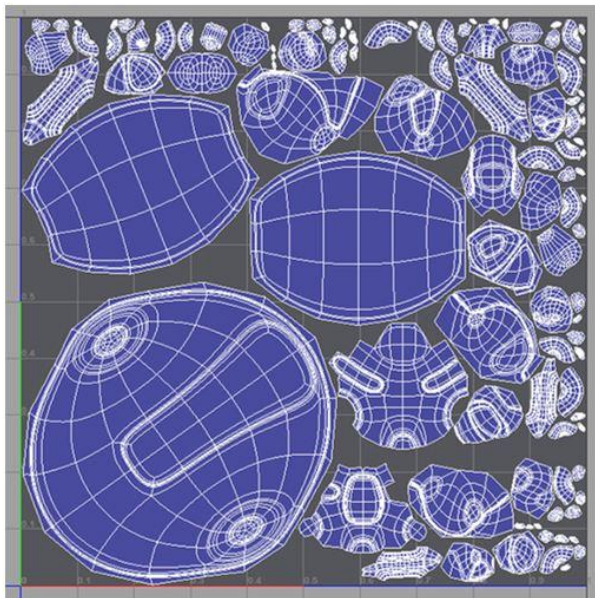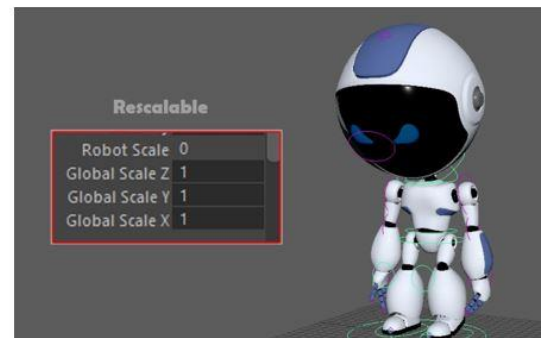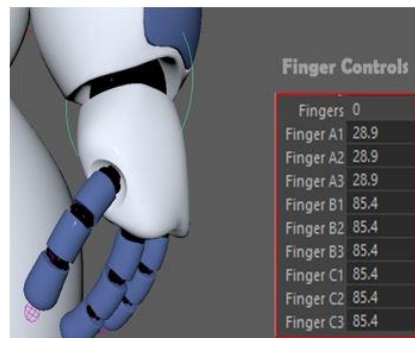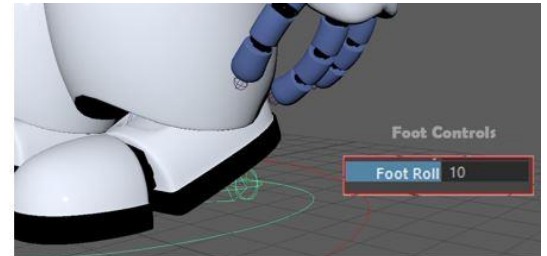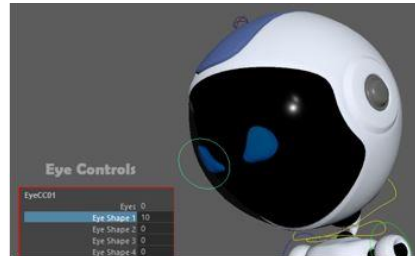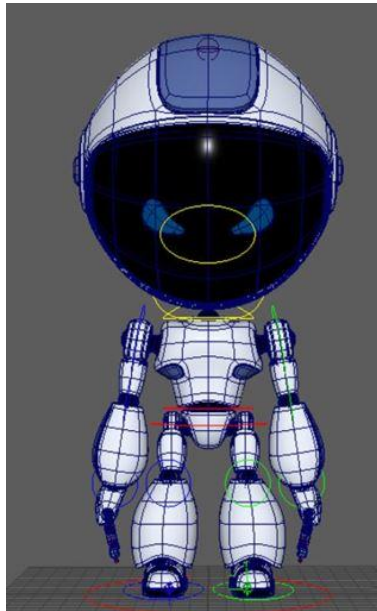

[Massive for Maya](#) is one of the best-known for generating crowds and it is now fully integrated into Maya.

The Maya version provides you with the simplest workflow, using Maya tools, so you can navigate your scene attributes using familiar tools like the Outliner or Graph Editor. This makes for a streamlined and intuitive workflow with less of a learning curve. Stay in one application to build hordes of zombies or armies of mounted apes, or populate your streets, bridges and buildings with realistic townsfolk.

Learning Objective 3: Generate simple characters to enhance your short-animated films

Eye Controls

EyeCCD1

	Eyes	0
Eye Shape 1		10
Eye Shape 2		0
Eye Shape 3		0
Eye Shape 4		0

Foot Controls

Foot Roll 10

Finger Controls

Fingers	0
Finger A1	28.9
Finger A2	28.9
Finger A3	28.9
Finger B1	85.4
Finger B2	85.4
Finger B3	85.4
Finger C1	85.4
Finger C2	85.4
Finger C3	85.4

Rescalable

Robot Scale	0
Global Scale Z	1
Global Scale Y	1
Global Scale X	1

# Learning Objective 4: Implement custom workflows to enhance your short film with music and special effects

Maya Effects lets you quickly create complex animation effects such as smoke and fire. Each Maya effect offers many options and attributes for tuning the results. Effects Assets provides a number of preset effects that are organized as Maya assets
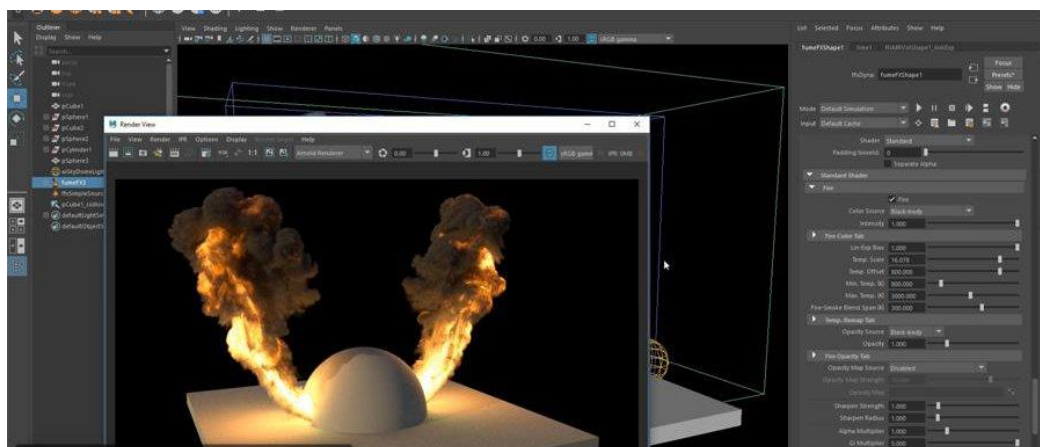
Maya – Omniverse

- The NVIDIA Omniverse™ Maya Connector Plug-In offers a robust toolkit for Maya Users to send and live sync their model data to an Omniverse Nucleus.
- This not only gives Maya users a first class renderer through Omniverse View or Omniverse Create but also the ability to open, edit and sync with any application supporting Omniverse Connect.
- Now, depending on the use case, Maya users can choose the workflows and pipelines that work best for their needs while maintaining up to date revisions for all downstream consumers of their work.
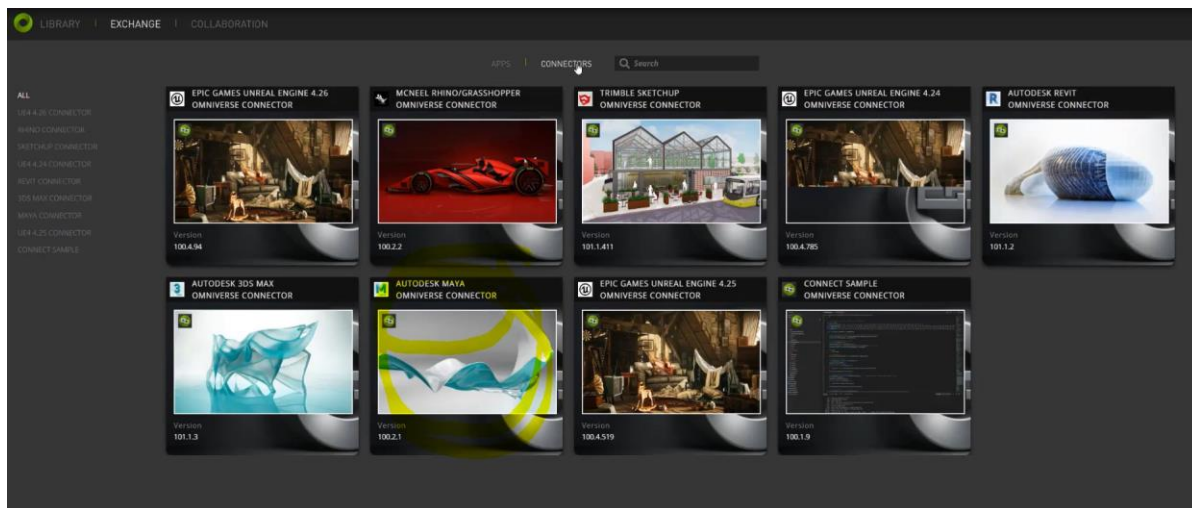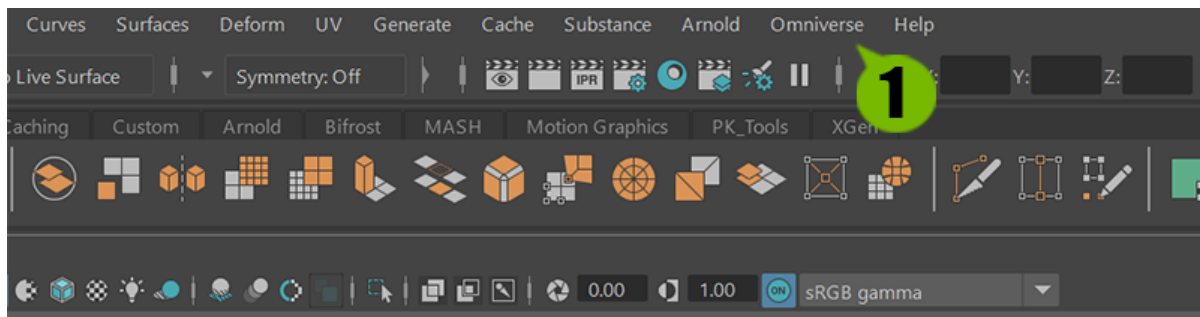
Favorite Tips and Tricks

- Choose Windows > Editors > Settings & Preferences > Plug-in Manager from the menu bar; the Plug-in Manager window will be displayed.
- Clear the check boxes that you don't need. It will speed up Maya's boot time.
- For copying the polygon objects, select the object and press CTRL +D. Next, press W to activate Move Tool and move the copied object to the desired position. Next, press SHIFT+D to copy the object to the same distance.
- You can increase or decrease the size of gyro using the + and - keys, respectively. These keys are displayed on choosing Move Tool, Rotate Tool, or Scale Tool.
- If you want to change the background color of viewport, hold down the ALT key, and press B.
- If you want to smoothen the low poly model without increasing the subdivision level, press 3.

Resources

Getting to know Maya:

Intro to Maya: Interface Tour (video)

Interface overview

Autodesk knowledge network – Maya Support and Learning

Maya Documentation- what's new, product updates and installation guides

Maya 2022 Bonus Tools

Plugins:

Top Maya plugins

Maya Open Source Components

Arnoldrenderer

Maya Wikipedia page Autodesk Maya

VR Solutions:

Maya - Omniverse

Sketch tools for Illustrations, Comics, Design

11 Best Drawing Software of 2021

Texture Treasure hubs:

- Cgtextures
- Paul Bourke
- polantis
- Enscape3d
- Patreon
- Texture haven
- 3dtextures
- Substance3d
- Cc0textures
- CG trader

Shotgrid overview

Acknowledgments

- Thank you to the Autodesk University team, Maya Product team
- A big Thank You to our families, colleagues, and all attendees of this session
- Media and Entertainment cohort