

1. 3D modeling concepts, techniques and tools: Introduction to Blender

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Outline

- I. 3D computer graphics
- II. 3D modeling concepts

III.Introduction to Blender



II. 3D modeling concepts and tools

4. 3D modeling tools

Title	Developped by	License	3D Rendering Support
CINEMA 4D	MAXON Computer	Commercial software	Yes
Maya	Autodesk Media and Entertainment	Commercial software	Yes
LightWave 3D	NewTek	Commercial software	No
3ds Max	Autodesk Media and Entertainment	Commercial software	Yes
Blender	Not a Number Technologies (NaN) and NeoGeo	Free and open- source	Yes



Activity

Activity 1.2	Title: Compare some 3D modeling tools		
Туре:	Group activity – research work		
Goal:	Familiarize students to 3D techniques, concepts and tools ILO P1		
Outline:	 During this activity, students should: Conduct a bibliographic research about three modeling tools : Blender, Maya and 3ds Max Compare these tools using the following metrics: Usability in the 3D industry Performances Functionalities Documentation Prepare a presentation 		
Timeline	A week		
Assessment	Assess the presentation of each group		



1. Presentation

- 3D computer modeling and animation software
- Written in C, C++ and Phython
 - + Professional, free and open-source
 - + multiplatform (Windows, Linux, Mac OS X...)
 - + Non memory intensive
 - Not Available in some languages
 - Difficult to use at the beginning
- Blender's features : 3D modeling, UV unwrapping, texturing, sculpting, animating, rendering...
- Integrated game engine



2. Blender installation

Download the appropriate package (Last stable release is the 2.79 version, official website: <u>http://www.blender.org</u>), unpack the compressed file anywhere on your Computer

> Installation requirements

Hardware	Minimum performance	Optimal performance
CPU	32-bit dual core 2Ghz CPU with SSE2 support	64-bit eight core CPU
RAM	2 GB	16 GB
Monitor	24 bits 1280×768 display	Two full HD displays with 24 bit color
Keyboards	Working number pad (optional but recommended)	Working number pad
Graphic card	OpenGL-compatible graphics card with 256 MB RAM	Dual OpenGL-compatible graphics cards, quality brand with 3 GB RAM
Mouse	Mouse or trackpad	Three button mouse and graphics tablet

3. Mouse notation

Notation	Action or Button
LMB	click with the Left Mouse Button
ММВ	press down on (don't turn) the scroll wheel or Middle Mouse Button
RMB	click with the Right Mouse Button
SCROLL	turn the scroll wheel in either direction



4. Blender interface

Starting Blender

🔕 Blender		
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4. Blender interface

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Left Mouse Bottom (LMB)-click to remove the initial title box



4. Blender interface

- Primary elements of Blender's interface:
 - Viewport,
 - Outliner,
 - Properties panel,
 - Timeline panel,
 - Toolbar



4. Blender interface





4. Blender interface

- The viewport: view into the 3D space (the workspace), contains the following features
 - Grid floor
 - Objects: a mesh, a lamp, and a camera by default
 - 3D cursor





4. Blender interface

• The Outliner:

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- Cantains list and names of all objects in the scene
- Rundown of the scene in hierarchical order
- Outliner view: list of all of the components in the scene
- Display controls: toggle an object as visible, selectable, and/or renderable
- Display menu: set what is displayed in the Outliner view





4. Blender interface

- The Properties Panel: contains the setting of the scene (by default displays the Render properties)
 - Render properties
 - Other properties (Properties panel header): Objects, Modifiers, Shading, and so on

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4. Blender interface

• The Timeline Panel: time management for animation

- Scrub bar
- Frame controls
- Play controls





4. Blender interface

- The Toolbar: common tools for modeling, rendering and animation
 - Object Tools panel: list of tools pertaining to working with objects
 - Operator panel: displays the most recent operation performed





5. Headers

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5. Headers

Viewport header:





5. Headers

> Properties panel header:

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Properties Panel Header 📰 🖬 🐨 💿 🖉 🏸 🔍 😒	■ ¥ <
Render: How the screen renders	
Scene: Basic scene functions	
World: Controls for scene background	
Object: Crontrols for the selected object	
Object Constraint: Interaction with other objects	
Modifiers: Effect the selected object	
Object data: Data effecting the selected object	
Textures: How the objects surface looks	
Particles: Object can emit particle effects	
Physics: How the object behaves	
JB.com	Uploaded By: 121

6. Navigation in the viewport

> The viewport is the worksapce

- **Panning**: Shift+Middle Mouse Button (MMB) and moving your mouse.
- **Rotating**: clicking and holding the MMB while dragging until the desired viewing angle.
- Zooming: using the scroll function of your MMB, or by using the + and/or - keys on the numeric keypad., or by using Ctrl+MMB.



6. Navigation in the viewport

Specific	viewing
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	Toggle F <u>u</u> llscreen	Arealser Pe	rsp Alt F10
	Toggle <u>Maximize</u>	Area C	trl Up Arrow
	Toggle Quad View	,	Ctrl Alt Q
	Duplicate Area in	to New Wir	ndow
	Playback Animati	on	Alt A
	View All		Home
	View Selected		Numpad .
	View Global/Loca	ł	Numpad /
	Show All Layers		
	Render Border		Ctrl B
	Zoom Border		Shift B
	Clipping Border		Alt B
	Align View		
	Navigation		
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Properties)

X is the left and right

X is the left and right Y is the forward and back Z is the up and down



- Setting the user preferences
 - Accessible via File > User Preferences
 - **Interface**: The Interface preferences allow to customize how the menus, Viewport, and navigation react to the users.
 - Editing: The Editing preferences let customize object properties.
 - **Input**: The Input preferences allow to configure custom hot keys for Blender to better suit the workflow.
 - Add-Ons: This pane, gives access to many add-ons that are available by default in Blender.
 - Themes: Everything can be changed exactly to your liking through this panel.
 - File: The File preferences contains settings related to saving and loading Blender files.
 - **System**: The System preferences pertain to settings that affect Blender's speed and performance.



7. Blender Customizing

Interface Editing		Input	Add-ons	Themes	File	System
Display:		View Manipulation:			🗹 Manipulator	
🗹 Tooltips		🗹 Cursor Depth			Size:	75 px 🕥
🕑 Python Tooltips		Auto Depth			Handle Size:	25%)
Solution Object Info		Zoom To Mouse	Position		Hotspot:	14 px 🕨
Large Cursors		Rotate Around S	election			
ビ View Name		🗹 Global Pivot			Menus:	
Playback FPS		🗹 Camera Parent I	_ock		Open On Mouse Over	
Global Scene		Auto Perspective	e		Top Level:	5 🔊
(Object Origin Size:	6 px 🕨	Smooth View:		200 🔊	Sub Level:	2 🕑
		Rotation Angle:		15 🕨	Pie Menus:	
🗹 Display Mini Axis					Animation Timeout:	6)
Size:	25 🕨	2D Viewports:			Recenter Timeout:	0 >
(Brightness:	8 🕨	Minimum Grid Spa	acing:	35 px 🕨	Radius:	100 px 🕨
		TimeCode Style:	Minimal Info	¢	Threshold:	12 px 🕨
					 Confirm Threshold: 	0 px 🕨

Show Splash

Save User Settings



7. Blender Customizing

Changing Blender's Layouts

- Splitting the Viewport : Two methods
 - Using the handles at the bottom-left and upper-right corners of the Viewport. By dragging up the handle you will split the view horizontally, by dragging to the right you will split it vertically (1)
 - By clicking with your RMB on the divider between the panels
- Merging Panels : the reverse operation of the splitting (2)
- Changing Window Types: providing access to a specific set of tools, options, viewers... (3)















7. Blender Customizing

Changing Blender's Layouts

- Activating Quad View (4)
 - Provide a view from the top, front, and right, and a camera/user perspective
 - Press N Key, click Toggle Quad View from the Display category of the Viewport properties
- Using the Screens Option: gives access to different layout types (5)







7. Blender Customizing



(5)



Activity

Activity 1.3	Title: Set Blender viewport and layout
Туре:	Individual activity- Lab exercise
Goal:	Illustrate how can we manipulate the Blender viewport and layout ILO P1
Outline:	 During this activity, students should: Split the viewport in two lines and two columns using the two different techniques. After each splitting operation, merge the different panels to obtain the default viewport Change the Blender's layout as you want
Timeline	5 minutes
Assessment	Assess the ability of each student to control the Blender viewport and layout



Thank you for your attention!

