B0 - HUB

B-INN-000

Blender

Mastering Blender - 3D Modeling and Animation

Blender

binary name: no binary
repository name: no repository
language: no languages
compilation: no compilation
build tool: no need here

- The totality of your source files, except all useless files (binary, temp files, obj files,...), must be included in your delivery.
- All the bonus files (including a potential specific Makefile) should be in a directory named *bonus*.
- Error messages have to be written on the error output, and the program should then exit with the 84 error code (0 if there is no error).

WORKSHOP-BLENDER

Overview

In this workshop, you will learn the fundamentals of Blender, a powerful open-source 3D modeling and animation software.
Whether you are a beginner or have some experience with Blender, this workshop will provide you with the skills and knowledge needed to create stunning 3D models and animations.

Introduction

blender website
blender documentation
blender studio showdown

The Blender Foundation (2002) is an independent public benefit organization with the purpose to provide a complete, free and open source 3D creation pipeline, managed by public projects on blender.org.

Blender Foundation facilitates a public project on blender.org with the mission to get the world's best 3D CG technology in the hands of artists as free/open source software.

It's vision is that everyone should be free to create 3D CG content, with free technical and creative production means and free access to markets.

Workshop Objectives

- Familiarize with the Blender interface and navigation
- Learn basic modeling techniques, such as creating and manipulating 3D objects
- Gain an understanding of Blender's material system for applying textures
- Explore basic animation techniques, including keyframing
- Create a simple 3D object from scratch

Workshop Schedule

Installation

If you don't have already installed Blender, you can download it from the official website.

Introduction to Blender

- Overview of Blender interface and navigation
- Understanding the different editor windows in Blender
- Navigating in 3D view and basic manipulation of objects

Basic Modeling Techniques

- Creating and editing basic 3D objects (e.g., cube, sphere, and cylinder)
- Understanding the edit mode and basic editing tools
- Applying basic transformations (e.g., scaling, rotating, and translating)
- Introduction to basic modifiers (e.g., mirror and subsurf)

Materials and Textures

- Overview of Blender's material system
- Applying materials and textures to 3D objects
- Basic texture mapping techniques (e.g., UV unwrapping)
- Introduction to basic shading options in Blender

Animation Basics

- Understanding Blender's timeline and animation editors
- Introduction to keyframing for basic object animation
- Basic animation techniques (e.g., translating and rotating objects)
- Previewing and rendering basic animations in Blender

Create Your First 3D Object

- Applying the learned techniques to create a simple 3D object
- Adding basic materials and textures to the object
- Basic object animation using keyframes
- Rendering and exporting the final 3D object as an image or video

Conclusion

By the end of this 2-hour workshop, you will have gained a basic understanding of Blender's interface, essential modeling techniques, and basic animation concepts.
You will be able to create your own simple 3D objects, apply materials and textures, and create basic animations.
Join us and take your first steps into the exciting world of Blender!

Exercise 1: Navigating the Blender Interface

Resources blender interface

- Launch Blender and familiarize with the main components of the interface, such as the viewport, toolbar, and properties panel.
- Explore the different editor windows, such as the 3D view, outliner, and properties, and understand their functionalities.
- Practice navigating and customizing the editor windows to create a personalized workspace that suits your workflow.

Exercise 2: 3D View Navigation

- Learn essential navigation techniques in the 3D view, such as orbiting, panning, and zooming using the mouse and keyboard shortcuts.
- Experiment with different camera views and navigation modes, such as perspective and orthographic views, and local and global orientations.
- Use navigation tools, such as the fly mode and walk mode, to move around the 3D scene and explore objects from different angles.

Exercise 3: Object Manipulation

- Create basic 3D objects, such as a cube, sphere, and cylinder, using the add menu or shortcuts.
- Practice basic object manipulation techniques, such as scaling, rotating, and translating objects in the 3D view using the manipulator and hotkeys.
- Understand the pivot point and transformation orientations and experiment with different options to control the behavior of object transformations.

Exercise 4: Creating and Editing Basic 3D Objects

- Create a cube, sphere, and cylinder using the “Add” menu or shortcut keys.
- Practice editing basic objects in “Edit Mode” to modify their vertices, edges, and faces using selection tools, transformation tools, and basic editing operations.
- Experiment with different object creation and editing techniques to understand their effects on the geometry and topology of the objects.

Exercise 5: Basic Transformation Techniques

- Practice applying basic transformations, such as scaling, rotating, and translating, to objects in the 3D view using the manipulator and hotkeys.
- Experiment with different pivot points and transformation orientations to understand their impact on the objects’ transformations.
- Use the “Snap” tool to precisely align objects or vertices in the scene.

Exercise 6: Introduction to Basic Modifiers

- Understand the concept of modifiers in Blender and their role in non-destructive modeling workflows.
- Learn to apply basic modifiers, such as the "Mirror" and "Subsurf" modifiers, to create symmetrical and smooth objects.
- Experiment with different settings and options of the modifiers to achieve desired results and understand their effects on the object's topology and geometry.

Exercise 7: Applying Materials and Textures

- Create a simple 3D object, such as a cube or sphere.
- Apply a basic material to the object using Blender's material system.
- Experiment with different material properties, such as color, roughness, and metallicness, to understand their effects on the object's appearance.
- Apply a basic texture to the material using an image or procedural texture and adjust its mapping options.

Exercise 8: Basic Texture Mapping Techniques

- Learn the basics of UV unwrapping, including marking seams, unwrapping, and adjusting UV islands in the UV editor.
- Apply a texture to a UV-unwrapped object using an image texture and adjusting its mapping coordinates.
- Experiment with different UV mapping techniques, such as planar, cylindrical, and spherical mapping, to understand their effects on the texture mapping.

Exercise 9: Introduction to Basic Shading Options

- Explore Blender's shading options, including smooth shading, flat shading, and auto-smooth.
- Experiment with basic shading techniques, such as vertex color shading, face maps, and procedural shading, to understand their effects on the object's appearance.
- Create a basic node-based material using Blender's shader editor and adjust its properties to achieve desired shading effects.

Exercise 10: Understanding Blender's Timeline and Animation Editors

- Familiarize yourself with Blender's timeline and animation editors, including the Dope Sheet and Graph Editor.
- Learn how to navigate and manipulate the timeline to set the animation length, frame rate, and playback options.

- Understand the basic concepts of keyframing, including adding keyframes, interpolating between keyframes, and editing keyframe properties.

Exercise 11: Introduction to Keyframing for Basic Object Animation

- Create a simple 3D object, such as a cube or sphere.
- Learn how to set keyframes for basic object animation, such as translation (moving) and rotation (spinning) using Blender's keyframe workflow.
- Experiment with different interpolation types, such as linear, bezier, and constant, to understand their effects on the object's animation.

Exercise 12: Basic Animation Techniques

- Explore basic animation techniques, such as animating object properties, using constraints, and creating basic physics simulations in Blender.
- Practice animating objects with multiple keyframes to achieve complex animations, such as bouncing, scaling, and spinning animations.
- Learn how to use the graph editor to fine-tune animation curves and achieve smooth and realistic motion for your objects.

Exercise 13: Previewing and Rendering Basic Animations

- Understand how to preview and play back animations in Blender's timeline and animation editors.
- Learn how to render basic animations to image sequences or video formats using Blender's rendering options.
- Experiment with different rendering settings, such as resolution, frame rate, and output formats, to achieve desired results in your animations.

Exercise 14: Applying the Learned Techniques to Create a Simple 3D Object

- Review the concepts and techniques covered in previous workshops, including the Blender interface, navigation, basic modeling, materials, and textures.
- Create a simple 3D object, such as a house, tree, or vehicle, using the techniques learned.
- Experiment with different modeling tools, such as extrusion, scaling, and rotating, to shape and refine your 3D object.
- Practice creating a basic 3D object from scratch, and apply the principles of good topology for clean and efficient geometry.

Exercise 15: Adding Basic Materials and Textures to the Object

- Apply basic materials and textures to your 3D object using Blender's material system.
- Learn how to create and edit materials, apply textures, and adjust their properties, such as color, transparency, and roughness.
- Experiment with different texture mapping techniques, such as UV unwrapping or procedural textures, to enhance the appearance of your 3D object.
- Practice applying materials and textures to different parts of your object, and understand how to use node-based materials for more advanced shading options.

Exercise 16: Basic Object Animation Using Keyframes

- Animate your 3D object using keyframes to bring it to life.
- Practice using Blender's timeline and animation editors to set keyframes for object transformations, such as translation, rotation, and scaling.
- Experiment with different interpolation types, such as ease in/out, to achieve desired motion for your object.
- Learn how to use the graph editor to fine-tune animation curves and create smooth and natural motion.

Exercise 17: Rendering and Exporting the Final 3D Object as an Image or Video

- Preview and play back your animation in Blender's timeline and animation editors.
- Learn how to render your 3D object as an image sequence or video using Blender's rendering options.
- Experiment with different rendering settings, such as resolution, frame rate, and output formats, to achieve desired results in your final render.
- Practice exporting your 3D object as an image or video file, and learn how to use Blender's compositing nodes for post-processing and final touches.

Conclusion

If you have reach this far, congratulations! You have completed the Blender 3D Modeling and Animation Workshop. We hope you have learned a lot and enjoyed the workshop.
If you have any questions or feedback, please feel free to create an issue on the repos with your question or feedback. We will try our best to answer your questions and improve the workshop based on your feedback.