Blender 3D for Jobseekers

Learn professional 3D creation skills using Blender 3D

Laurie Annis

www.bpbonline.com

First published: 2023

Published by BPB Online
WeWork
119 Marylebone Road
London NW1 5PU

UK | UAE | INDIA | SINGAPORE

ISBN 978-93-55518-118

www.bpbonline.com

Dedicated to

Laurie Annis

For daring to believe in me, even when nobody else did

About the Author

Laurie Annis is an ethical entrepreneur and 3D/XR artist, designer, and developer with 10 years of experience converting her passion for games into a fun and sustaining career in 3D, preceded by over 20 years of experience in graphic design for social impact businesses.

Laurie's 3D skills helped her land her first dream job in 3D modeling and leading a team of 3D artists working on the multiplayer VR game Hypatia, available on Steam. Laurie is currently engaged in her next dream job as co-founder of the interactive narrative game AncestoriesXR.com, making indie games and stock assets freelance as Unreality3D.com, and founder of theAssetConnection.com, which helps connect Buyers and Creators of stock 3D models, textures, animations, effects, audio, and tools for 3D.

About the Reviewers

- **Oliver Villar** is a Spanish digital artist who has taught Blender since 2010 with tutorials, courses, and private classes through Blendtuts.com and at the University of Murcia. In 2016, he started **Blendtuts.es** to focus on teaching Blender to the Spanish community. He's the author of the book "**Learning Blender**", which has sold over 30k copies worldwide, and one of the organizers for several editions of "Blendiberia", the most important yearly national event for Blender users in Spain.

- **Arunkumar Bala Sundaram**, with 16 years of experience in CGI, is a good representation of a true Artist in many ways! He developed his skills in Jewellery design and Metal Fabrication, which involved intricate works and an eye for detail. Then he branched off into the CGI field, starting as a Web and Graphic designer after getting his Diploma in digital visual media from the Institute Of Multimedia Arts And Graphic Effects. He enhanced his skills to become a CG Generalist / Lighting Artist and compositing artist at Realworks studio. He contributed to the community by training some freshers for placement through his own Startup company. In 2017, he joined **House of Blue Beans**, a 100 % EOU product Visualization company, as Technical Lead and steadily grew to become a Functional Manager.

  Arun has continuously educated himself through formal degrees like BSc from IGNOU, attending CGI conferences and in-house leadership courses.

Acknowledgement

I wish to express immense gratitude to the original creator of Blender, Ton Roosendaal, for not simply creating and maintaining a tool that enabled me to develop marketable skills in the industry that I love, completely for free at a time when my family's finances were devastated, but also for inspiring a massive community of support that helped me help myself, and for proving that running a tech business ethically is not only possible but also sustainable and life-sustaining. It is because of your example that I am confident in doing business in this space conscientiously.

I also wish to express my gratitude to BPB for giving me the opportunity to write the book that has been burning in my heart since I first found Blender and started to hone the skills I needed to keep myself sane and my family afloat at one of the most difficult times in our lives, as a mom being relentlessly harassed by her children's abusive other parent. While Blender 3D for Job Seekers is a technical manual, it is still very personal work because the accessibility and power of this professional creative tool literally saved my and my children's lives and I consider this my opportunity to pay the favor forward.

I am eternally grateful to my children, who through their own powerfully loving, courageous, just, and kind natures, have achieved so much: freed themselves from their other parent's torture, worked incredibly hard to heal tremendous wounds, and graciously continue teaching me how to be a better person every day. Without you, none of this – the book, the professional work I enjoy so much, nor my deep sense of purpose in life – would exist. I am humbled and honored to be welcomed into your lives.

Likewise, without the extraordinary support of my mom, Annis Hopkins, none of us would be here today. I will never be able to repay your care and generous kindness to us all.

No acknowledgment of the existence of this work would be complete without more appreciation for Kevin, the love of my life than I can ever express. Without your loving presence for the past decade and a half, I would have lost the will to press forward many times over. You are my dream come true!

Preface

The opportunities for fulfilling, sustaining work in 3D have never been more plentiful than they are today, with everyone from solo and indie developers to mega-corporations employing the immense power of 3D to immerse and engage audiences in ways that 2D media cannot: by allowing viewers to experience art, entertainment, education, industry, medicine, advertising and more, from every perspective, inside and out.

Learning how to create in 3D is a daunting and lengthy process, no matter which software is used. Folks just starting out have an especially hard time choosing applications that are worthy of such great investments in effort and time that will serve them all the way from a beginner to a professional. This book is designed to equip new and aspiring 3D creators with the fundamentals of 3D creation and introduce the vast capabilities of the one industry-standard software which does all of that and happens to be free to use forever: Blender 3D.

Blender 3D for Job Seekers highlights the many facets of 3D creation, including modeling and sculpting, surface decoration, animation, effects, and preparing 3D creations for real-world markets, such as print, film, and games. Real-world exercises are designed to gradually acclimate readers to navigating and thinking in 3D space while inspiring further exploration through producing a marketable 3D asset suitable for games and interactive applications. Guidance on where to begin deeper exploration is provided with each core concept.

With the knowledge of how to get started creating in 3D, readers will be prepared to begin fulfilling creative work by making products that are in high demand in the vast, lucrative market of 3D.

Chapter 1: Features of Blender 3D - highlights the vast capabilities of Blender 3D for money-making content, from basic modeling to advanced skills, like special effects and physics simulations. Topics covered include ways that Blender is preferable to other 3D software, an overview of its core and advanced features, and ways to extend Blender's capabilities.

Chapter 2: Installation and Interface - walks the reader through the steps of downloading and installing Blender, opening Blender for the first time, and getting familiar with navigating the interface. Topics covered include getting started and

saving progress, understanding the defaults, short exercises to get acclimated, working between versions and updating, and customizing the interface.

Chapter 3: General 3D Concepts - introduces general 3D concepts that apply to all 3D software, giving readers the necessary foundation to begin creating in 3D. Topics covered include the anatomy of 3D objects, getting oriented to working in 3D space, perception versus reality, exercise in creating 3D objects from scratch and understanding basic operations.

Chapter 4: Polygonal Modeling - introduces polygonal modeling: the essential starting point for creating 3D objects. Topics to be covered include the differences between various methods of 3D creation from poly modeling to sculpting, low and high poly, planning projects, topology, and edge flow, and an example project beginning to model a marketable 3D pedestal from reference.

Chapter 5: Poly Modeling Extras - explores supplemental tools and techniques for poly modeling. Topics to be covered include the full set of tools in the Edit Mode toolbar, editing 3D objects with modifiers, curves, and text, and enabling and working with add-on resources.

Chapter 6: 3D Sculpting - introduces 3D sculpting: a method of creating and editing 3D models with great detail and organic shapes. Topics to be covered include when to sculpt and how to plan the project, helpful workflows and introduction to sculpting tools, an exercise adding sculpted detail to the 3D pedestal, and working between high and low poly objects.

Chapter 7: 3D Surfaces - introduces the standard way to prepare a 3D model for surface details like color, roughness, metallicness, and fake height variation, as well as how to apply colors, images, and effects to the surface of 3D models, and how to edit their appearance. Topics to be covered include unwrapping UVs, texturing and how to edit textures, Materials, and Shaders, and exercises adding textures and transferring sculpted detail from the previous exercise onto the 3D pedestal model.

Chapter 8: 3D Animation - will get readers started animating 3D creations. Topics to be covered include an overview of the timeline, keyframing, and animatable properties, types of 3D animation from bone to mesh animation with example exercises, and an introduction to the advanced animation tools.

Chapter 9: Effects and Simulations - gets readers started exploring special effects and simulations in Blender, from fantasy effects to realistic water, fire, smoke,

cloth, and even fur and hair. Topics to be covered include an introduction to the types of effects and simulations and their uses and exercises working with hair particles, modeling with physics, and creating a volumetric effect.

Chapter 10: Images and Video - teaches readers how to showcase their 3D models and animations in images and video, which can be used in portfolios, advertising, film, games, and an unlimited number of other creative projects. Topics to be covered include an overview of rendering, 3D cameras, lighting, shadows, reflections, and transparency, exercises in lighting and rendering the 3D pedestal, and an introduction to the advanced image and video editing capabilities of Blender.

Chapter 11: 3D in Production - readers will learn how to apply their 3D skills in Blender to earn money and become sought-after creators in their fields of interest. Topics to be covered include best practices, planning and optimization, pipelines and tools, working on teams, and finding a niche.

Coloured Images

Please follow the link to download the
Coloured Images of the book:

https://rebrand.ly/g5yswbv

We have code bundles from our rich catalogue of books and videos available at **https://github.com/bpbpublications**. Check them out!

Errata

We take immense pride in our work at BPB Publications and follow best practices to ensure the accuracy of our content to provide with an indulging reading experience to our subscribers. Our readers are our mirrors, and we use their inputs to reflect and improve upon human errors, if any, that may have occurred during the publishing processes involved. To let us maintain the quality and help us reach out to any readers who might be having difficulties due to any unforeseen errors, please write to us at :

errata@bpbonline.com

Your support, suggestions and feedbacks are highly appreciated by the BPB Publications' Family.

Piracy

If you come across any illegal copies of our works in any form on the internet, we would be grateful if you would provide us with the location address or website name. Please contact us at **business@bpbonline.com** with a link to the material.

If you are interested in becoming an author

If there is a topic that you have expertise in, and you are interested in either writing or contributing to a book, please visit **www.bpbonline.com**. We have worked with thousands of developers and tech professionals, just like you, to help them share their insights with the global tech community. You can make a general application, apply for a specific hot topic that we are recruiting an author for, or submit your own idea.

Reviews

Please leave a review. Once you have read and used this book, why not leave a review on the site that you purchased it from? Potential readers can then see and use your unbiased opinion to make purchase decisions. We at BPB can understand what you think about our products, and our authors can see your feedback on their book. Thank you!

For more information about BPB, please visit **www.bpbonline.com**.

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

https://discord.bpbonline.com

Table of Contents

1. Features of Blender 3D 1
Introduction 1
Structure 1
Objectives 2
Alternatives to Blender 2
What 3D software does 3
Blender is feature rich 4
Blender is capable 5
Blender is affordable 6
Blender is accessible 6
Blender is performant 7
Blender is user friendly 8
Blender is compatible 8
Blender is extensible 9
Conclusion 9
Points to remember 10
Questions 10

2. Installation and Interface 11
Introduction 11
Structure 11
Objectives 12
Getting started 12
Versions and updating 12
Finding the right version 13
Timing updates 13
Working between versions 14
Navigating the interface 14
The default layout 15

View navigation 20
Saving progress 22
Save everything 23
Packing to save 23
Backup features 25
Auto save 25
Undo history 26
File reverting 26
File recovery 27
Customizing the interface 29
Perspective 33
Editing preferences 36
Essential shortcuts and hotkeys 38
Getting help 39
Conclusion 39
Points to remember 39
Questions 40

3. General 3D Concepts 41
Introduction 41
Structure 41
Objectives 42
Anatomy of 3D Objects 42
Getting Oriented in 3D Space 44
Perspective again 45
Scene statistics 46
Modes, and editing 3D objects 48
Primitive Objects 51
Editing normals 52
Enabling backface culling 55
Transforms 57
Transforming with gizmos 57

Transforming with hotkeys *59*
Transforming with parameters *60*
Combining hotkeys with parameters *62*
Undoing transforms *62*
Origins and applying transforms *63*
Blender's 3D cursor *65*
Transforming with tool bar tools *66*
Selection 66
Mode dependent selection *67*
Conclusion 68
Essential shortcuts and hotkeys 68
Points to remember 69
Questions 69

4. Polygonal Modeling 71
Introduction 71
Structure 71
Objectives 72
Triangles, quads, and ngons 72
Pros and cons of triangulation *74*
Methods of 3D creation 75
Hard surface versus organic *76*
Poly modeling versus sculpting *77*
Low poly versus high poly *77*
Low to high, large to small *79*
Planned complexity *80*
Where to start *82*
Topology and edge flow 82
Shading and smoothing *85*
Beginning to add detail *89*
Selecting linked sub-objects *90*
Snapping *91*

Hiding and unhiding geometry *96*
Transforming with the 3D cursor *98*
Updating shading *108*
Combining, reusing, and repeating shapes *110*
Merging loose geometry *121*
Advanced selections *122*
Checking for, and correcting common issues *124*
Conclusion 126
Essential shortcuts and hotkeys 126
Points to Remember 128
Questions 128

5. Poly Modeling Extras 129
Introduction 129
Structure 129
Objectives 130
Additional tools 130
Annotate and measure *130*
Add *131*
Extrude *131*
Inset Faces *132*
Bevel *133*
Loop Cut *133*
Knife and Bisect *134*
Poly Build *136*
Spin and Spin Duplicates *136*
Smooth and Randomize *137*
Edge Slide and Vertex Slide *137*
Shrink and Fatten, Push and Pull *138*
Shear and To Sphere *139*
Rip Region and Rip Edge *140*
3D viewport wrap up 141

Transformation orientation *141*
Proportional editing *144*
Modifiers 145
Applying and removing modifiers *145*
Modifier artifacts *146*
Empty Objects *146*
Array modifier *147*
Boolean Modifier *149*
Mirror *151*
Additional modifiers *152*
Curves and Text 152
Handle types *156*
Converting curves to mesh and mesh to curves *157*
Additional primitive objects 158
Conclusion 159
Essential shortcuts and hotkeys 159
Points to remember 161
Questions 162

6. 3D Sculpting 163
Introduction 163
Structure 163
Objectives 164
Planning to sculpt 164
Low poly goal *164*
High poly goal *165*
Destructive or non-destructive *166*
Resolution and subdivision *166*
Starting to sculpt 168
Brush categories *169*
Brush settings *170*
Conclusion 180

Essential shortcuts and hotkeys....181
Points to remember....182
Questions....183

7. 3D Surfaces....185
Introduction....185
Structure....185
Objectives....186
Surfaces....186
Textures....187
Texture maps....188
Baked textures....189
Texturing maps....190
Texture painting and editing....190
UVs....191
UV space....192
Unwrapping and editing UVs....192
UV seams....195
UV packing....195
Conclusion....222
Essential shortcuts and hotkeys....222
Points to remember....223
Questions....224

8. 3D Animation....225
Introduction....225
Structure....225
Objectives....226
Anatomy of animations....226
Animatable properties....226
Animation types....231
Bone Animation....231
Mesh animation....232

Physics animation 232
Editing animations 238
Advanced animation concepts 239
Conclusion 243
Essential shortcuts and hotkeys 243
Points to remember 244
Questions 245

9. Effects and Simulations 247
Introduction 247
Structure 247
Objectives 248
Types of effects and simulations 248
Particles and hair 249
Physics behaviors and forces 258
Modeling with physics 258
Atmospheric effects 266
Conclusion 269
Essential shortcuts and hotkeys 270
Points to Remember 271
Questions 272

10. Images and Video 273
Introduction 273
Structure 273
Objectives 274
Staging renders 274
Render engines 274
Rendering styles 275
3D Cameras 277
3D lights 280
3D Shadows 281
Editing images and video 286

Conclusion 287
Essential shortcuts and hotkeys 287
Points to remember 289
Questions 289

11. 3D in Production 291
Introduction 291
Structure 291
Objectives 292
Best practices 292
Production 292
Getting started 293
Shared understanding 293
Asset lists 293
Rough drafts 294
Refinement 294
Starting over 294
Budgeting 294
Priorities 295
Performance 296
Design 297
Optimization 298
LODs 300
Conventions 301
Other workflow optimizations 301
Preparing 3D objects for production 302
Importing and exporting 302
Pipelines and tools 305
Project management 306
Version control 306
Documentation 307
Complementary tools 307

Next steps....308
Finding a niche....*309*
Conclusion....310
Essential shortcuts and hotkeys....310
Points to remember....312
Questions....312

Index....313-318

Chapter 1
Features of Blender 3D

Introduction

Welcome to **Blender 3D for Job Seekers**, and congratulations! We are about to embark on a journey of creative and financial freedom and empowerment. Before we begin navigating the application, we will discuss the many reasons why Blender 3D – referred to as **Blender** from this point forward – is preferable to other 3D creation software.

Structure

This chapter highlights the vast capabilities of Blender for fun, satisfying creation of sustaining, money-making content, from simple primitive 3D objects to special effects. Topics to be covered include:

- Competitors
- Standards
- Features
- Capabilities
- Affordability
- Accessibility

- Performance
- User Friendliness
- Compatibility
- Extensibility

Objectives

Every industry imaginable uses and pays for 3D content. We have probably seen 3D employed by multiple industries all around us, just today, without even realizing it. While the average person may only imagine video games and film using 3D, 3D content creators also contribute to the fields of science, medicine, education, journalism, marketing, manufacturing, and innovation, among others.

The category of 3D creation software is cluttered with a wide range of options. To weigh each of these options as an aspiring 3D content creator, one must first consider the context. What do we want to create in 3D? What is even possible? After reading this chapter, we will understand when and why to choose Blender over other 3D creation software.

Alternatives to Blender

A quick internet search of "3D software" will reveal several major competitors who have paid to have their products appear at the top. The ubiquity of costly alternatives to Blender has little to do with the quality of other applications or their user reviews. Instead, that predominance reveals a malicious side of corporate efforts to mandate widespread dependence on inferior and prohibitively expensive products, throughout entire industries like computer-aided drafting. Fortunately, Blender's developers have come to the rescue.

Mission

Get the world's best 3D CG technology in the hands of artists as free/open source software."

-Blender.org

The founders of Blender seek to democratize the money-making power of 3D creation tools, by reducing as many barriers to Blender's use as possible. Instead of forcing out competition through exclusive agreements with bureaucratic institutions, Blender was designed to empower creators through its compatibility with other 3D creation software. Instead of developing proprietary file formats, for example, Blender allows the import and export of the widest variety possible, making Blender the go-to application for converting one 3D file format to another.

What 3D software does

The same internet search for "3D software" will reveal a few software packages that can do some part of what Blender is capable of overall, which highlights a significant way that Blender excels: in its flexibility. In general, all 3D software can be used to create basic 3D components – from the vertices, edges, and faces which make up all 3D geometry, to simple shapes like cubes, cylinders, and spheres – for combination into more complex structures as shown in *Figure 1.1*:

Figure 1.1: *Simple character made of 3D objects assembled in Blender*

Advanced 3D software often specializes in one area of 3D creation or another. **Zbrush**, for example, excels in the niche of high-resolution 3D sculpting. **Marvelous Designer** excels in the 3D cloth niche. Blender, on the other hand, performs both tasks and more adequately, in a way that is seamless with other 3D workflows (see *Figure 1.2*):

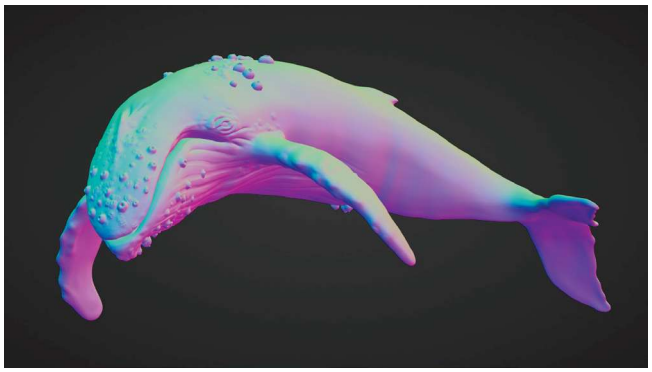

Figure 1.2: *High-resolution 3D model sculpted and posed in Blender*

Some of Blender's competitors offer similar varieties of more general functionality. **3DS Max** and **Maya**, for example, perform the same 3D modeling, 3D surface design, 3D animation, and rendering tasks that Blender does. Unlike other general-purpose

3D applications, however, Blender is not a haphazard assortment of functionality added on by developers who do not use and directly benefit from those features. Because Blender is developed by the very 3D creators who use Blender in production day in and day out, each of Blender's capabilities was conveniently crafted to complement the rest.

Above all, Blender is an industry standard suite of 3D creation tools. The term "industry standard" means that Blender can produce output that is not only fully functional for production, but also meets the highest standards of quality possible, wherever it is used in the creation of video games, interactive applications, film, and television, advertising, simulation, printing, digital archiving, education, science, and even medicine.

Blender is feature rich

Blender is primarily a 3D modeling software, but also much more. Blender comes loaded with every basic feature a 3D creation software might need. The most basic features of Blender include:

- 3D modeling and sculpting
- 3D model and scene editing
- 3D surface design (UVs, textures, materials, shaders)
- 3D animation (rigging and skinning, mesh morphing, keyframing)
- Rendering 2D images and videos of 3D objects and scenes

While 3D modeling alone is powerful functionality, Blender is also capable of many advanced features out of the box, like:

- 2D drawing and combined 2D+3D drawing
- 2D animation and combined 2D+3D animation
- Rendering 360 images and videos
- Recording, compositing, and editing images, videos, and audio
- SFX (volumetrics, particles, and motion tracking)
- Physics simulations (cloth, fluid, smoke and fire, forces)
- Procedural and parametric modeling (geometry nodes, modifier stack)
- Scripting and modding Blender itself
- Game development

Blender is capable

Blender's capabilities are vast, which means that when we learn how to use Blender, our capabilities will also become vast.

It is easy to identify the most common applications of 3D creations, enabled by Blender. Entertainment represents a trillion-dollar industry using 3D in every digital product from video games to film (both short and feature-length), as well as television. 3D is also used in the design and manufacture of toys, board games, and sports accessories. But entertainment uses only scratch the surface of 3D's power.

Science also employs 3D in every facet of the field: from illustration, education, and training to simulation and safety. From the far reaches of outer space to the depths of volcanic activity, 3D provides views into and interactions with the microscopic and macroscopic, real, and theoretical, in ways that just are not possible in the real world (yet).

Medicine is similarly served by 3D through illustration and education, as well as through medical treatments ranging from virtual experiences that cure or alleviate pain and trauma to the design and manufacture of assistive devices and prosthetics, from teeth to limbs.

Education also utilizes 3D to achieve more engaging and more thorough illustration of the known world through immersion and interaction, enabling embodiment that expands understanding, in addition to facilitating experimentation and exploration of the unknown.

Journalism employs 3D for archiving and documentation, ensuring the veracity of information, and communicating news and history in ways that increase empathy, by personalizing stories and immersing consumers in surprising and challenging topics.

Marketing with 3D generates virality and problem/solution awareness by giving customers a fuller perspective of products and services through affordable, accessible prototypes and visually stunning presentations.

Manufacturing enjoys the same benefits Science and Marketing do, through the affordable and safe design, testing, and additive and subtractive production of products, as well as worker training and automated assembly, all enabled by 3D.

Innovation is 3D. The amount of overlap between the uses of 3D in all the above industries speaks to the universal nature of 3D. The future is 3D, whether that means the realization of retro visions like holograms and holodeck experiences, or modern movements to build a digital twin for everything real within a shared metaverse.

Blender users the world over have contributed 3D creations to every single one of these industries, thanks to Blender's versatile capability.

"Free and Open Source

Blender is a public project hosted on blender.org, licensed as GNU GPL, owned by its contributors. For that reason Blender is Free and Open Source software, forever."

-Blender.org

Blender is affordable

One of the most compelling aspects of Blender is that it is absolutely, 100% free, forever; and not just free to learn, but also free to use commercially. This means there are no restrictions to using Blender to make money, and the developers of Blender take no cut of users' profits. If we have not yet run into the creative block of prohibitively expensive 3D creation software, we can consider ourselves lucky, because software comparable to Blender typically costs thousands of dollars per year for commercial use and upgrades.

It is not just the "sticker price" of competing 3D software that answers the question, "Why choose Blender?" Nor is it merely the capabilities of Blender compared to competitors that should be considered. Possibly the most compelling answer to this question is why those competitors exist, and at what cost. Frankly, the largest players in 3D software entered the market to make the corporations money, whereas Blender was created **by its users to empower other creators**.

Blender is accessible

The cost of using any 3D software package is not limited to the initial monetary outlay. There are additional costs like licensing to consider. The most popular competing 3D software packages do offer lower-priced educational licenses, but they restrict educational versions to non-commercial use. This is intentional, to trap users into spending more money through dependence. Blender, on the other hand, has only one license with no restrictions on commercial use, and the Blender Foundation charges no royalties no matter how much money we make using it.

There are other barriers to consider with competing 3D software, such as the availability and price of updates, training, supplemental content, and productivity tools like add-ons or plug-ins. Whereas competing 3D software must be updated yearly by creators who need to keep their skills relevant to the market – often at the same price as the original software – Blender is updated multiple times a year, always free of charge.

There are thousands of time and effort saving add-ons available for Blender, many for free and some paid. On the other hand, add-ons and plug-ins for comparable 3D software almost always cost a great deal more simply because their developers need

to charge more to recoup higher costs of development. The availability of Blender for free has nourished the growth of an unparalleled community of 3D creators offering free mutual support and very reasonably priced training and resources.

As the adage goes, time is money, and the time between learning and implementing new skills is also shorter for Blender than for comparable 3D software. Because we can learn Blender entirely on our own using free and affordable tutorials that are readily available online, we can get started creating money-making content with Blender today! No need for a college degree to acquire marketable 3D skills.

Vision

"Everyone should be free to create 3D CG content, with free technical and creative production means and free access to markets."

-Blender.org

Blender is also completely open-source, which means that anyone can change the code and modify Blender free of charge. We can develop Blender tools for ourselves or offer them for sale as well. When we sell anything we made with Blender – whether it be assets, scripts, tutorials, or tools – we are not restricted from profiting from our own work. As one might imagine, this freedom has opened the floodgates of Blender's developer community creativity.

Another benefit of Blender's accessibility is its unique license model, which will ensure its longevity. Users of paid and proprietary software often suffer when that software gets sold to another business and winds up fundamentally changed or even abandoned, but Blender's GNU General Public License model will ensure those tragedies never happen to Blender users.

Blender is performant

The specs for necessary hardware to run Blender are much lower than with other 3D applications (which can also equate to monetary savings). Although any 3D task can push the boundaries of computer hardware, Blender and Blender workflows can be easily adjusted to run well on minimal specs, making 3D creation possible even for youth, older adults, students, and borrowers or owners of low-end computers. While Blender users can enjoy plug-and-play drawing tablet functionality, all of Blender's operations can be performed with a mouse by default.

Blender is also a remarkably bug-free software. Even with years of use, we may never need to report a bug, but rest assured that Blender's developer community will be responsive if we do. Blender's exceptionally high-quality user experience is attributable to the fact that Blender's code is maintained by its avid community of users, and the fact that it is upgraded at no cost, multiple times each year.

Blender is user friendly

While creating in 3D space is challenging in and of itself, Blender is particularly user-friendly due to its logical layout and easily customized interface. In version 2.8, Blender's UI was overhauled by community developers, to better align it with the needs and preferences of everyday users. Every element, from icons and color schemes to button behavior and hotkey mapping was thoughtfully debated and carefully redesigned where needed. The resulting improvements have been widely celebrated since.

Every panel of Blender can be moved, duplicated, scaled, and even converted into a panel of another type and back again. Typical Windows File, Edit, Window and Help functions, plus a row of tabs that toggle between convenient layouts for the most common tasks appear across the very top of the main viewport. Hotkey presets are provided to match a variety of industry standard functions and can be easily remapped, while any available action can be added as a Quick Favorite bound to the Q key.

Blender's UI also employs progressive disclosure, which means the enabling of advanced features is conveniently accessed through the Preferences dialogue, without cluttering the view for more common tasks.

Blender is compatible

Blender is compatible with all other industry standard 3D creation software, which is an astonishing feat. Not only can we use Blender in place of expensive, exclusive software like 3DS Max, Maya, Zbrush, and 3D Coat, but we can also use Blender with all of those and more, in the same production pipeline.

For example, Blender is compatible with the entire suite of Adobe Creative Cloud software, such as *Photoshop*, *Illustrator*, *Premiere Pro*, *After Effects*, *Substance Painter*, *Substance Designer*, and the rest. All of the file formats that these apps have in common with Blender can be transferred back and forth seamlessly. Blender also allows the selection of *Photoshop*, *Krita*, *Gimp*, and any other image editing software as the preferred external tool.

Blender is also fully compatible with popular game development software, such as *Unity*, *Unreal*, *Godot*, and every other modern game engine. As previously mentioned, Blender allows for the import and export of all the commonly used (and some uncommon) 3D formats for web, mobile, desktop, and console games, viewers, and interactive applications: *FBX, OBJ, STL, GLTF*, and *USD* to name a few.

Blender is extensible

Finally, while Blender can be used to create an infinite variety of income sources all on its own, Blender's capabilities can be extended even further using both free and paid add-ons and plug-ins. Some of the most popular add-ons for Blender enable:

- Human character, hair, and clothing generation
- Humanoid and creature animation
- Nature prop generation
- Motion capture, animation, and editing
- Advanced simulations and SFX
- Architectural visualization and CAD
- Data visualization
- 3D printing preparation
- Advanced 3D editing (UV editing, retopology, LOD, optimization)
- Asset management and more

Since multiple web pages, articles, video tutorials, and entire marketplaces are devoted to the add-ons and plug-ins available for Blender, we will not address them in any great depth here. It is important to note, however, that Blender's extensibility is also superior to that of its competitors.

The relatively low cost and great abundance of extensions to Blender's core functionality truly set it apart as the 3D creator's software of choice. For this reason, hundreds of thousands, if not millions of freelancers and entire businesses thrive and owe their existence to Blender's welcoming, enthusiastic community, and ecosystem built on the foundation of democratizing tech.

Conclusion

As we have seen, Blender is the obvious choice for beginners in 3D and seasoned professionals alike, when compared with its competitors. Blender easily meets industry standards with its versatile features, capabilities, and performance. No 3D creation software comes close to Blender's accessibility and user-friendliness. Finally, we have learned that Blender opens doors to other 3D creation tools rather than locking users in and offers limitless potential for creative expression and financial sustainability.

In the following chapter, we will install and open Blender for the first time, to get familiar with its interface and learn handy navigation shortcuts. In *Chapter 3, General*

3D Concepts we will delve into understanding 3D in general, and discover even more proof that Blender is the ultimate tool for creating in 3D.

Points to remember

- 3D is a trillion-dollar industry with uses in multiple lucrative fields.
- Popular and pricey does not equate to quality 3D creation software.
- Software licensing and subscription models impact our ability to make a living long-term.
- Blender makes learning and profiting from 3D skills accessible and affordable.

Questions

1. What are basic features of 3D creation software?
2. What are advanced features of 3D creation software?
3. What other 3D creation tools exist besides Blender?
4. What are the advantages to using free and open-source software?
5. Why is compatibility with other software important?

Join our book's Discord space

Join the book's Discord Workspace for Latest updates, Offers, Tech happenings around the world, New Release and Sessions with the Authors:

https://discord.bpbonline.com

Chapter 2
Installation and Interface

Introduction

Now that we understand the benefits of using Blender for 3D creation, we'll start by installing the application and then learn to navigate the interface. Getting familiar with any new software package can be intimidating, but Blender is a bit different from most. Because Blender is developed and maintained *by* 3D creators *for* 3D creators, any time you wonder where or why a feature exists in Blender, you are sure to find a logical answer at your fingertips.

Structure

This chapter will walk the reader through the steps of downloading and installing Blender, opening Blender for the first time, and getting familiar with navigating and customizing the interface. Topics to be covered include:

- Getting started in Blender
- Versions and updating
- Navigating Blender's interface
- Saving your progress
- Backup features

- Customizing the interface and preferences
- Essential shortcuts and hotkeys
- Where to get help and expand your Blender knowledge

Objectives

After reading this chapter we will be comfortable installing, launching, and navigating Blender, then customizing it to our needs, locating every Blender tool at our disposal, and saving all our progress with confidence.

Getting started

To get started using Blender, first visit the Blender Foundation's website at **https://www.blender.org/**. A link to the downloads page appears in bold on the main page, above the fold. On the downloads page, the most recent version of Blender for your OS will be highlighted by a prominent button which you may click to begin your download. Alternatively, you may select a Windows, macOS, Linux, or another version of Blender from the dropdown list below that, or an LTS version from the lower link.

Following your download, a confirmation page will appear with an invitation to support Blender development. Contributing to these funds is voluntary, so feel free to sign up now or come back later when Blender inevitably becomes your favorite software.

Double click the file in your downloads folder, click **Next**, accept the License Agreement, and follow the installation wizard prompts. Blender does not start upon installation by default, so you'll navigate to the **Start menu**, **Launchpad**, or **desktop**, and click the icon to open the application.

Versions and updating

Note: In this chapter, we will refer to Blender version 3.1.2, however, the instructions herein will apply equally to any version 3.0 or newer. Future chapters will refer to the most recent version of Blender at the time of writing and will remain forward-compatible.

The number of Blender version options can be overwhelming at first, but it will be helpful to briefly look at the system in place for Blender releases to learn how to evaluate when it is time to upgrade, downgrade, double up, or stick with a version you already have installed.

As discussed in *Chapter 1, Features of Blender 3D*, Blender's free and open-source approach provides us with unique benefits including assurance that Blender will never be sold or abandoned. That means Blender updates will not stop so long as there are users using it.

This also means that multiple versions of Blender are available at any given time, and that content made for Blender, such as tutorials, assets, plug-ins, add-ons, and books like this one, may refer to features of a different version from the one that you are using.

As noted in this chapter, we refer to Blender version 3.1.2. Midway through this writing, Blender version 3.2 was released, and the impending release of Blender 3.3 in a few months' time was also announced. On top of that, Blender releases a **Long Term Support** (**LTS**) version every year, which receives important bug fixes and updates but often lags in terms of features.

This is normal, and as explained by Ton Roosendaal – original creator of Blender – is designed to, "*ensure that a project that started with an LTS version can be completed with the same version in a reasonable amount of time.*"

For these reasons, the decision was made to tailor the illustrations and instructions contained in the chapters of this book to each new release, to show the way that Blender users typically work with an always-improving software.

Finding the right version

First, when a new version of Blender is announced, take a look at the release notes pages on *Blender.org* to find out what will be changing: **https://www.blender.org/download/releases/** Blender Foundation won't spam you or require a login, so to be notified of updates to Blender you may want to subscribe to one of the many online market places that promote Blender training materials, plug-ins/add-ons and assets.

Don't immediately switch to a newer version of Blender in mid-production, but feel free to download the latest version at any time. Newer versions of Blender will install in a directory next to the previous one, rather than overwriting it, allowing you to run multiple versions of Blender on your computer system at once. Windows Desktop and Start menu shortcuts will be updated to the newest version, but shortcuts pinned to the Taskbar will not, and unless you choose to delete the old version, both can coexist in your **Program Files** > **Blender Foundation folder** and be used interchangeably.

Timing updates

As Roosendaal and the Blender Foundation intended, you should consider timing any updates to coincide with the start and end of your Blender projects. When you

are just starting out, this will likely be a very short cycle, such that you can complete a project before a new version is released. When you begin working on larger projects, it is advisable to hold off updating until completion, unless a new feature is essential to your product.

Working between versions

It's reassuring to know that when we need to, it's simple to work between multiple versions of Blender. Two different versions can be opened and run simultaneously, and **Ctrl + C** works to copy a selected object from one Blender instance and **Ctrl + V** works to paste it into another. Alternatively, data from one Blender file can be Linked or Appended to another BLEND file even if it is closed, via **File** > **Link**, or **File** > **Append**. Linking data maintains its relationship to the source file, so changes made externally affect that data in the linked file. Appending severs the relationship with the source file, so changes to either file do not impact the other (and doubling the space that data occupies on the hard drive).

To open two instances of Blender at once, navigate to where Blender is installed, usually in **C:/Program Files/Blender** Foundation on Windows machines. Inside this folder you will find Blender versions you have installed, in folders named to match their version number. Inside each numbered folder, locate the blender.exe, right-click, and select Pin to Start. When you click on the shortcut for each version, additional instances of Blender will open in the selected version.

To identify which version you are currently looking at, look in **Status Bar** at the very bottom right of the Blender application. If there are no numbers there, right-click that space and enable Blender Version.

Navigating the interface

A new installation of Blender will open with a Quick Setup overlay as shown in *Figure 2.1*. For 3D creators who are accustomed to other 3D software, the Shortcuts options can be adjusted to make working with Blender more familiar. Users of prior versions of Blender can also load settings saved in other versions here. Since this book assumes little or no prior experience with 3D software, we will start with the default settings.