

GAME ANIM

VIDEO GAME ANIMATION EXPLAINED



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JONATHAN COOPER

Game Anim

Video Game Animation Explained



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Jonathan Cooper



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*For Clara & Jade,
whose adventures in real life
inspire me in the virtual.*



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Contents

Preface	xv
Additional Legal Notices	xvii
Acknowledgments	xix
Author	xxi
Chapter 1: The Video Game Animator	1
What It Means to Be a Video Game Animator	1
Artistry & Creativity.....	1
Technical Ability.....	2
Teamwork.....	2
Design Sense.....	3
Accepting the Nature of the Medium	3
Life Experience.....	3
Different Areas of Game Animation	4
Player Character Animation.....	4
Facial Animation	5
Cinematics & Cutscenes	5
Technical Animation.....	6
Nonplayer Characters	6
Cameras	6
Environmental & Prop Animation	7
Required Software & Equipment	8
Digital Content Creation (DCC) Software	8
Game Engines.....	8
Reference Camera.....	9
Video Playback Software	9
Notepad	10
Chapter 2: The Game Development Environment	11
Finding the Right Fit	11
Studio Culture.....	11
Team Strengths	12
Game Pillars.....	12
Team Size	13
Team Dynamics	13
Game Animator Roles.....	14
Gameplay Animator	14
Cinematic Animator	14
Lead Animator	14
Animation Director.....	15
Principal Animator	15

Technical Animator	16
Animation Technical Director	16
Other Game Development Disciplines	16
Programming	17
Art	17
Design	18
Audio & Effects	19
Quality Assurance	19
Management	19
Public Relations & Marketing	20
A Video Game Project Overview	20
Phase 1: Conception	20
Phase 2: Preproduction	23
Phase 3: Production	24
Phase 4: Shipping	25
Phase 5: Postrelease	26

Chapter 3: The 12 Animation Principles 27

Principle 1: Squash & Stretch	28
Principle 2: Staging	29
Principle 3: Anticipation	30
Principle 4: Straight Ahead & Pose to Pose	31
Principle 5: Follow-Through & Overlapping Action	32
Principle 6: Slow In & Slow Out	33
Principle 7: Arcs	35
Principle 8: Secondary Action	36
Principle 9: Appeal	37
Principle 10: Timing	38
Principle 11: Exaggeration	39
Principle 12: Solid Drawings	40

Chapter 4: The Five Fundamentals of Game Animation 41

Feel	41
Response	42
Inertia & Momentum	42
Visual Feedback	43
Fluidity	44
Blending and Transitions	44
Seamless Cycles	46
Settling	46
Readability	47
Posing for Game Cameras	47
Silhouettes	49
Collision & Center of Mass/Balance	49
Context	50
Distinction vs Homogeneity	50
Repetition	51
Onscreen Placement	52

Elegance	52
Simplicity of Design	53
Bang for the Buck	54
Sharing & Standardization	54
Chapter 5: What You Need to Know	57
Basic Game Animation Concepts	57
Common Types of Game Animation	57
Cycles	57
Linear Actions	58
Transitions	58
Skeletons, Rigs, & Exporting to Game	59
How Spline Curves Work	62
Collision Movement	66
Forward vs Inverse Kinematics	69
Intermediate Game Animation Concepts	70
State Machines	70
Parametric Blending	71
Partial Animations	72
Additive Layers	73
Physics, Dynamics, & Ragdoll	74
Advanced Game Animation Concepts	76
Procedural Motion & Systems	76
Full-Body IK	77
Look-Ats	77
Blend Shapes	78
Muscle Simulation	79
Animated Textures/Shader	79
Artificial Intelligence	80
Decision-Making	80
Pathfinding	80
Chapter 6: The Game Animation Workflow	83
Reference Gathering	83
Don't Be Precious	85
Animate Pose to Pose over Straight Ahead	86
Rough It In	86
Get It In Game!	87
Iteration Is the Key to Quality	87
Blocking from Inside to Out	88
Pose-Sharing Libraries	89
Keep Your Options Open	90
Use Prefab Scenes	91
Avoiding Data Loss	92
Set Undo Queue to Max	92
Configure Auto-Save	92
Save Often	93
Version Control	93

Chapter 7: Our Project: Preproduction	95
Style References	96
Defining a Style	97
Comparisons	97
Realism vs Stylized	97
Who Is the Character?	98
Previz	98
Gameplay Mock-Ups	98
Target Footage	100
Prototyping	101
Pitching the Game	103
 Chapter 8: Our Project: Technical Animation	 107
Character Setup	107
Modeling Considerations	108
Skinning	110
Rigging	111
Animation Sharing	113
File Management	114
File-Naming Conventions	114
Folder Organization	115
Referencing	117
Exporting	118
Export Data Format	119
Engine Export Rules	120
Animation Memory & Compression	120
Animation Slicing	120
In-Engine Work	121
Event Tags	121
Blend Timing	123
Scripting	123
Test Levels	124
Asset Housekeeping	125
Digital Content Creation Animation Tools	125
 Chapter 9: Our Project: Gameplay Animation	 129
The Three Cs	129
Gameplay Cameras	130
Settings & Variables	130
Camera-Shake	132
Ground Movement	133
The All-Important Idle Animation	133
Seamlessly Looping Walk/Run Cycles	134
Animating Forward vs In Place	137
Inclines, Turning, & Exponential Growth	138
Strafing	139

Starts, Stops, & Other Transitions	140
Ten Common Walk/Run Cycle Mistakes	142
Jumping	143
Arcs	144
Take-Off	145
Landing	145
Climbing & Mantling	146
Height Variations & Metrics	146
Collision Considerations	147
Cut Points & Key Poses	147
Alignment	147
Attack Animations	148
Anticipation vs Response	149
Visual Feedback	150
Telegraphing	150
Follow-Through & Overlapping Limbs	150
Cutting Up Combos	152
Readability of Swipes over Stabs	153
Damage Animations	153
Directional & Body Part Damage	153
Contact Standardization	154
Synced Damages	154
Recovery Timing & Distances	155
Impact Beyond Animation	156
 Chapter 10: Our Project: Cinematics & Facial	159
Cinematic Cameras	160
Field-of-View	160
Depth-of-Field	161
The Virtual Cameraman	162
The Five Cs of Cinematography	163
Cutscene Dos & Don'ts	163
The 180 Rule	164
Cut on an Action	164
Straddle Cuts with Camera Motion	164
Trigger Cutscenes on a Player Action	164
Avoid Player in Opening Shot	165
Use Cuts to Teleport	165
End Cutscenes Facing the Next Goal	165
Avoid Overlapping Game-Critical Information	165
Acting vs Exposition	165
Allow Interaction Whenever Possible	166
Avoid Full-Shot Ease-Ins/Outs	166
Track Subjects Naturally	167
Consider Action Pacing	167
Place Save Points after Cutscenes	167

Planning Cutscenes.	168
Cutscene Storyboarding.	168
Cutscene Previsualization.	168
Cutscene Workload.	170
Scene Prioritization.	170
Cutscene Creation Stages.	171
The Eyes Have It	171
Eyelines.	172
IK vs FK Eyes.	173
Saccades.	174
Eye Vergence.	174
Thought Directions.	175
Lip-Sync.	175
Phonemes	175
Shape Transitions.	176
Facial Action Coding System	176
Sharing Facial Animation	178
Creating Quantities of Facial Animation	178
Troubleshooting Lip-Sync	179

Chapter 11: Our Project: Motion Capture 183

Do You Even Need Mocap?	184
How Mocap Works.	185
Different Mocap Methods	185
Optical Marker-Based.	185
Accelerometer Suits	185
Depth Cameras	186
Performance Capture	186
The Typical Mocap Pipeline.	187
Mocap Retargeting.	188
Mocap Shoot Planning.	188
Shot-List	188
Ordering/Grouping Your Shots	189
Rehearsals	190
Mocap Previz.	190
Working with Actors	190
Casting.	191
Directing Actors.	192
Props & Sets	193
Prop Recording.	194
Set Building	195
Virtual Cameras	197
Getting the Best Take	197
Working with Mocap.	199
Retiming	199
Pose Exaggeration	200
Offset Poses.	201

Hiding Offset Pose Deltas	202
Blending & Cycling	203
Chapter 12: Our Project: Animation Team Management	209
Scheduling	209
Front-Loading	209
Prioritizing Quality	209
De-Risking	210
Predicting Cuts & Changes	211
Adaptive Schedules	211
Conflicts & Dependencies	212
Milestones	213
Teamwork	214
Collaboration	214
Leadership	215
Mentorship	216
Hiring	217
The Animation Critique	217
Outsourcing	218
Chapter 13: Our Project: Polish & Debug	221
Closing Stages of a Project	221
Alpha	221
Beta	222
Release Candidates & Gold Master	222
Animation Polish Hints & Tips	223
Foot-sliding	223
Popping	224
Contact Points	224
Momentum Inconsistency	225
Interpenetration	225
Targeted Polishing	226
Memory Management & Compression	227
Debugging Best Practices	228
Test/Modify Elements One by One	228
Version Control Comments	229
Avoid Incrementally Fine-Tuning	229
Troubleshooting	230
Chapter 14: The Future	237
Getting a Job	237
The Game Animation Demo Reel	237
What to Include	238
Editing Your Reel	239
The Reel Breakdown	240
Your Résumé	241
Your Web Presence	242
The Animation Test	243

Incoming Technologies	244
Virtual Reality	244
Affordable Motion Capture	245
Runtime Rigs	246
In-Game Workflow	246
Motion Matching	246
Procedural Movement	247
Machine Learning	247
Index	249

Preface

It's an incredibly arrogant presumption to write a book on your chosen field, but in the intervening decades between my first falling in love with video game animation and now, the medium has become something of a desirable career path (and no one else was going to do it). I've seen animation grow from a one-person throwaway on small teams to one of the largest multifaceted disciplines on the biggest video game projects and an important prerequisite for any studio with even modest storytelling ambitions. And yet, due to the medium's relative youth, the real details of game development are not covered by online articles or video tutorials, which instead focus on the (still very important) act of animation creation itself.

As I finish up this manuscript back home on a trip to Scotland, I realize I was fortunate to have grown up not just with games but also with the means to create computer art—even more so because my hometown birthed some of the most celebrated video game series in the world. While game development always seemed like an attainable career to me, I understand that's not the case for everyone. Similarly, video game animation (and development as a whole) has for years been economically inaccessible to most due to the cost of animation packages and tools. But with the internet; social media; and, most recently, the democratization of development with free game engines, animation tools, and digital distribution allowing anybody with a computer to start developing and get games out to an audience, I feel the time is now right to get everyone up to speed on this exciting field.

Written over the course of several years (because I'm very much still actively shipping huge games), this book is the result of notes taken every time I hit a new development phase and listed everything I considered important, regardless of the project. With this book, I hope to impart much of nearly two decades of knowledge working on a variety of game types in both in-game and cinematic roles in animator, lead, and director positions to make the reader as rounded a game animator as possible. All of this is based on personal experience so is bound to cause some disagreement, as not every studio approaches game development the same way, but the following pages are what I have found to work across multiple studios regardless of team size and culture, and should allow the game animator to focus on what's important (which goes far beyond just making beautiful animations).

I really hope you find this book useful, and I can't wait to see what the aspiring animators of tomorrow will create. The medium of video game animation is so linked to technology that we are forever reinventing processes and techniques, always making characters and worlds even more believable to entertain players around the world.

Jonathan Cooper



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Author



Jonathan Cooper is a video game animator from Scotland who has been bringing virtual characters to life since 2000. He has led teams on large projects such as the Assassin's Creed and Mass Effect series, with a focus on memorable stories and characters and cutting-edge video game animation. He has since been focusing on interactive cinematics in the latest chapters of the DICE and Annie award-winning series Uncharted and The Last of Us.

In 2008 he started the BioWare Montreal studio co-leading a team to deliver the majority of cinematic cutscenes for the 2011 British Academy of Film & Television Award (BAFTA) Best Game, Mass Effect 2.

In 2013 he directed the in-game team that won the Academy of Interactive Arts & Sciences (AIAS/DICE) award for Outstanding Achievement in Animation on Assassin's Creed III.

Jonathan has presented at the Game Developers Conference (GDC) in San Francisco and at other conferences across Canada and the United Kingdom, and holds a Bachelor of Design honors degree in animation.

You can follow him online at his website, www.gameanim.com, and on twitter at @GameAnim.



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The Video Game Animator

What It Means to Be a Video Game Animator

So you want to be a video game animator, but what exactly does that entail? And what, if any, are the differences between a video game animator and those in the more traditional linear mediums of film and television? While there are certainly a lot of overlap and shared skills required to bring a character to life in any medium, there are many unique technical limitations, and opportunities, in the interactive artform.

Artistry & Creativity

To begin with, having a keen eye for observation of movement in the world around you (and a desire to replicate and enhance it for your own creative ends) is the first step to becoming a great game animator. The willingness to not only recreate these motions but to envision how this movement might be controlled by yourself and others, allowing players to embody the characters you create, is a key factor in separating game animators from the noninteractive animators of linear mediums.

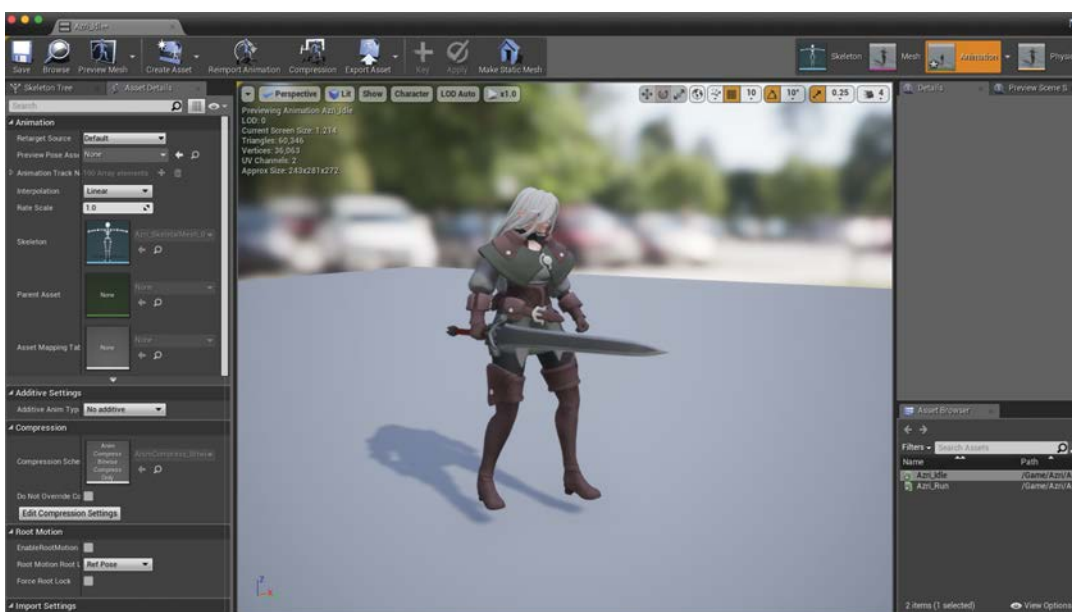
Understanding the fundamentals of weight, balance, mass, and momentum to ensure your characters are not only pleasing to the eye but meet with the player's understanding of the physics of the worlds they will inhabit are equally essential. A desire to push the envelope of visual and interaction fidelity within your explorable worlds, which can afford players new stories and experiences they could never have in the real world, with believable characters that are as real to them as any created in another medium, is a driving force in pushing this still-young medium forward.

The ultimate goal is immersion—where players forget they are in front of a screen (or wearing a virtual/augmented-reality headset), escaping their own physical limitations and instead being transported into our virtual world, assuming their character's identity such that it is “they themselves” (and no longer their avatar) who are in the game.

Technical Ability

Beautiful animations are only the first challenge. Getting them to work in the game and play with each other seamlessly in character movement systems is the real challenge. The best game animators get their hands dirty in the technical side of seeing their animations through every step of the way into the game. A good game animation team will balance animators with complementary levels of technical and artistic abilities, but strength in both areas is only a good thing.

Only in thoroughly understanding tools, processes, and existing animation systems will new creative opportunities open up to animators willing to experiment and discover new techniques and methods that might make animation creation more efficient or increase in quality.



Animation inside a game engine.

Teamwork

Beyond simply making motions look clean and fluid, it is a game animator's responsibility to balance multiple (sometimes conflicting) desires to make a video game. A finished game is always more than the sum of its parts, and when all of a development team's disciplines pull in the same direction in unison is when we delight and surprise players the most.

Animators must work in concert with designers, programmers, artists, audio technicians, and more to bring their creations to life, so those harboring a desire to sit with headphones on and the door closed, focusing solely on their own area, will be quickly left behind in the race to create the best possible experiences.

A game animator can only truly succeed with a good awareness of the other disciplines in game development and the ability to speak their language, empathize with their needs, and know at least a little of all areas of game development.

Design Sense

Game animations do not exist in a bubble and are not simply created to look good, but must serve a purpose for the greater game. Animators handling player character animation, especially, must balance a game's "feel" with visual fidelity (though the two are not mutually exclusive).

Designers touting conventional wisdom will often fall back on the tenet of quicker animations equaling better and more reactive characters, but go too fast without the appropriate visual feedback and the characters will simply not exist believably in the world, destroying the illusion of life and hurting the "feel" in the opposite direction. Ultimately, it is a game animator's responsibility to create consistency in the game world, with everything displaying a relative weight and physics, and gravity being a constant throughout.

In game development, we might hope that "everyone is a designer," but the best game designers are the keepers of the game's goals with an idea of how to reach them. It is the game animators' role to know enough of design to ensure their creations do not hurt but serve the design goals while maintaining visual fidelity as much as possible.

Accepting the Nature of the Medium

It goes without saying that a great game animator must be passionate about his or her chosen field, but must understand that this chosen field is not just animation but game development as a whole.

Those wishing for the more easily-scheduled approach of traditional linear animation production will likely grow frustrated with the fluid nature of game development. You cannot plan how many iterations it will take a new mechanic to be fun, so it follows that you must always be open to schedules in a state of flux.

Avoid being precious about your work because it *will* change or be thrown away, but, similarly, don't be dissuaded, because you will always improve and refine your animation as the game progresses, no matter how many times you might rework it.

Life Experience

The best game animators love playing games and can find something to learn from every work, but they also go beyond simply referencing other games or movies. If we wish to truly improve our artistic works (and gaming as a whole), we must escape the echo chamber of comparing with

and copying our peers and instead bring as much of our own varied life experience into our work as possible.

The blandest games are those that only reference their competition, and the most pedestrian animation choices are inspired only by other animation. Be passionate for games, but also be passionate for life and the world around you, and get away from the screen outside of work as much as possible.

Different Areas of Game Animation

While game animators in larger teams typically specialize, those at smaller studios may wear the many hats listed below. Regardless, even when specializing, it is incredibly valuable to understand other areas of game animation to open up opportunities for creativity across disciplines—often, the best results occur when lines are blurred such that an animator might excel in all moving aspects of a game.

Player Character Animation

The primary and easily most challenging aspect of game animation is the motion of characters under the player's control. This occurs in all but the most abstract of games and therefore is an important skill to focus on and for any game animator to have under his or her belt.

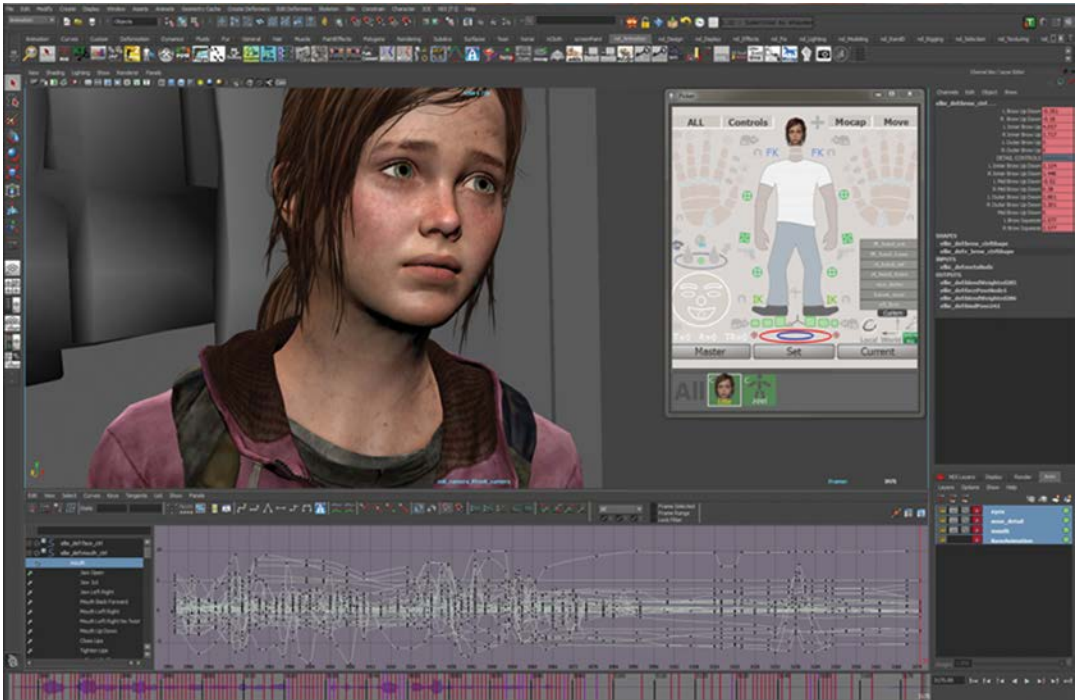
Character animation style and quality can vary greatly across different game types (and studios), depending upon their unique goals, but one thing is becoming more apparent as the medium progresses—bad character animation is unacceptable these days. Bringing up the baseline standard is one of the main goals of this book.



The Assassin is an excellent example of player character movement. (Copyright 2007–2017 Ubisoft Entertainment. All Rights Reserved. Assassin's Creed, Ubisoft, and the Ubisoft logo are trademarks of Ubisoft Entertainment in the US and/or other countries.)

Facial Animation

A relatively recent requirement, (due to advances in the quality of characters enabling us to bring cameras in close), is that even the most undiscerning player will be able to instinctively critique bad motion due to experience with other humans.



Great facial animation is a crucial element of story-based games like The Last of Us. (Courtesy of Sony Interactive Entertainment.)

How do we avoid these pitfalls when aiming to create believable characters that serve our storytelling aspirations? There are many decisions throughout a project's development that must work in concert to bring characters to life that are not just believable, but appealing.

Cinematics & Cutscenes

A mainstay of games with even the slightest degree of storytelling, cinematic cutscenes give developers the rare opportunity to author scenes of a game enough so that they play out exactly as they envision. A double-edged sword, when used sparingly and done well, they can bring us much closer to empathizing with characters, but used too much and they divorce us from not just our protagonists but the story and experience as a whole.

A well-rounded game animator should have a working knowledge of cinematography, staging, and acting to tell stories in as unobtrusive and economical a manner as possible.