

**Autodesk®**

Game Development  
Solutions

Create. Animate. Integrate.



Image courtesy of Bungie Studios

**Autodesk®**

# Create, animate, and integrate more productively with cutting-edge interoperability, using Autodesk game development solutions.

Autodesk provides the game development community with production-proven tools that enable end-to-end top-quality asset creation. With this suite of solutions, developers can create whatever they imagine.

Industry watchers estimate that 85 to 90 percent of all contemporary video games use Autodesk tools in development. The worldwide popularity and extensive use of Autodesk® 3ds Max® and Autodesk® Maya® software make these products industry standards. Autodesk® Mudbox™ software, a premier digital-sculpting and texture-painting solution, complements them both. Featuring a highly intuitive user interface (UI) and a powerful creative toolset, Mudbox is ideally suited to 3D modelers and traditional sculptors alike.

In addition to innovative software designed specifically for professional artists, Autodesk also makes software and middleware tools for developers in distinct disciplines. Autodesk® HumanIK® middleware offers a robust, runtime full-body inverse kinematics (IK) solver, and Autodesk® Kynapse® middleware, used in the production of over 70 AAA titles, is the world's leading artificial intelligence (AI) solution.

Combined with 3ds Max, Maya, Autodesk® MotionBuilder®, and Mudbox software, you can take advantage of Autodesk's interoperability throughout your game development process. Now your entire team can create, animate, and integrate its work as well as bridge asset creation and runtime disciplines. Ultimately, your facility can realize a production environment that is more creative and productive.

Create, Animate, and Integrate...

## ...with the Best Tools

Artists consistently push the boundaries of creativity with the help of Autodesk's industry-leading game development tools. Whether you are developing for the latest generation pipelines, Xbox 360®, PLAYSTATION® 3, and Nintendo® Wii™ platforms, or legacy consoles, PC, Mac® computers, and mobile games pipelines, Autodesk tools enjoy wide acceptance and are an ideal choice.

## ...with the Highest Productivity

Artists can create and animate assets, then integrate them with a game engine more efficiently than ever before. In fact, Autodesk's most recent releases can help you streamline your creative pipeline to save both time and money.

## ...with Extensive Interoperability

Our tools both empower and expedite the creative process. Autodesk 3ds Max, Maya, MotionBuilder, and Mudbox software can be used in concert to refine the same 3D assets. Interoperability—to increase flexibility and inspire creativity—is central to Autodesk's evolving vision. Designers and developers can utilize the platform-independent Autodesk® FBX® software interchange technology to import content written with a wide variety of software.

# Create

Use the tools chosen by more studios to develop breakthrough characters, vehicles, and environments.

With their outstanding creative toolsets, 3ds Max and Maya are fully integrated 3D modeling, animation, effects, and rendering applications that have become the preferred choice of game developers worldwide, with the industry's largest community of artists.

## Autodesk 3ds Max

The tool of choice for out-of-the-box productivity.

- Fast, intelligent biped, quadruped, and crowd animation tools that simplify the process of creating animated characters
- Unparalleled polygon modeling and texturing workflow tools, including pelt mapping, render-to-texture, and projection, designed specifically to save texture artists' time
- Support for Cg, DirectX® 9, and DirectX 10 application programming interface in the viewport, allowing for in-engine material fidelity
- Vast range of third-party plug-ins that enable artists to quickly extend and customize the software
- Integrated MAXScript scripting language and a full application programming interface/ software developer kit (API/SDK) that help developers and scriptwriters extend and customize the software
- Efficient, nondestructive visual and parametric workflows

## Autodesk Maya

The tool of choice for workflow and pipeline control.

- Open architecture that facilitates incorporation of the software with production pipelines
- Full C++ API, including a hardware shader API, and two integrated scripting languages (Maya embedded language (MEL) and Python® scripting languages) for customizing, integrating, and extending the software
- Support for layered textures, multiple UV sets, and per-instance UV sets to improve viewport display quality and memory usage
- A full suite of production-proven polygon, NURBS, and subdivision surface modeling and texturing tools to promote efficiency
- A full range of specialized keyframe, nonlinear, and advanced character animation editing toolsets
- Industry-leading visual effects toolsets
- A unified rendering user interface and workflow
- Intuitive UI and comprehensive API documentation that make it easier for both artists and developers to learn and use Maya software

Incorporate Maya with your production pipeline easily and create immersive environments intuitively.



## Autodesk Mudbox

Production-proven creative freedom without technical details.

- A premier digital-sculpting and texture-painting solution
- A highly intuitive user interface for both digital and traditional sculptors
- A powerful creative toolset for creating ultra-detailed high-poly 3D models
- Breaks the mold of earlier 3D modeling applications by providing organic, brush-based 3D modeling

3ds Max can be customized by developers and scriptwriters to create a game like the recently released RACEDRIVER: GRID, complete with hyper-realistic graphics and lighting.



As always, Maya proved to be an infinitely expandable production tool. We used its suite of polygon modeling and UV mapping tools to create meshes for Resistance that are more detailed than any we've created before.

— Chad Dezern  
Art Director  
Insomniac Games

# Animate

Accelerate production with more motion capabilities and broad file compatibility.

Autodesk MotionBuilder software is designed specifically for animation. Like all Autodesk game development software, it benefits from the FBX file format to help you optimize your workflow, animate faster and more efficiently, regardless of data complexity.

## Autodesk MotionBuilder

Real-time productivity suite for 3D character animation.

- Unique, real-time architecture for creating and editing state-of-the-art animations in record time, regardless of data complexity
- Collection of real-time, character-centric tools that facilitate tasks ranging from traditional keyframe techniques to intensive motion-capture editing
- Nondestructive animation layering that allows animators to use existing animation assets without compromising their creative control
- Full-body FK/IK manipulation rigging tools that automate character setup
- Mixed media, nonlinear editing environment that lets animators loop and cycle animation data sets on the fly, as well as retarget animation data between characters
- Support for HumanIK middleware for seamless transfer of animation data between authoring and runtime

## Autodesk FBX

Streamline workflows with an open-standard, platform-independent 3D file format.

- Ability to publish to and convert from many different file formats, removing barriers to data compatibility and giving users the freedom to build the most efficient pipelines
- Enables facilities to open their pipelines to multiple 2D and 3D applications, including in-house applications
- Gives users access to content authored in any software package supporting the FBX format, enabling facilities to open their pipeline to multiple 2D and 3D applications, including 3ds Max, Maya, and MotionBuilder, as well as those developed in-house
- OBJ, DXF, 3DS, COLLADA, and other file formats can be converted to and from the .fbx format via a free utility

- The FBX plug-in for the Apple® QuickTime® application program is a component plug-in to play and interact with 3D files from any major 3D application inside QuickTime
- FBX SDK, a free, easy-to-use, C++ software development platform and API toolkit, helps developers transfer content into FBX format with minimal effort

Real-time, character-centric tools in MotionBuilder enable artists to develop and edit complex animations confidently and efficiently.



Our decision to use Autodesk's HumanIK within our game runtime allowed us to focus on what is important to us: gameplay, animation quality, character development... things that make a great game and a great player experience. The smooth workflow between MotionBuilder and HumanIK allows our animators to work in a quality-driven, iterative WYSIWYG environment.

— David Fraccia  
Director of Technology  
Radical Entertainment

3ds Max in concert with MotionBuilder, was instrumental in the development of Guitar Hero®, among today's most popular titles.



# Integrate

Import your animations into the runtime engine and solve wildly complex character problems.

Autodesk software provides runtime components for your game engine. Alter animations on the fly, and watch characters dynamically interact with their environments in a realistic way. For consistent, intelligent solving and natural-looking character animation, artists can leverage the world's premier artificial intelligence (AI) solution for game development and real-time simulations.

## Autodesk HumanIK

Runtime animation middleware integrated within the game engine for dynamic, in-game character animation.

- A powerful, runtime full-body inverse kinematics (IK) solver that offers consistent, intelligent solving resulting in natural looking character animation
- A runtime retargeting engine for characters of differing size, proportions, and skeletal hierarchy saves animators time while giving them more creative control
- The highly modular, multithreaded library reduces engineering time and costs, freeing developers to focus on core competencies
- Open architecture that allows for easy integration with existing animation engines, complementing existing game animation tool chains and working in unison with third-party solvers and middleware components, such as physics and simulation engines
- Full-fidelity playback of content authored with Autodesk 3D solutions helps make animation workflows more efficient
- Consistent solving with Maya full-body IK and MotionBuilder character setup gives animators a WYSIWYG (what you see is what you get) workflow
- Optimized for PLAYSTATION 3®, Xbox 360, PowerPC®, PC, PlayStation 2®, and Xbox platforms

## Autodesk Kynapse

The world's leading artificial intelligence (AI) solution for game development and real-time simulations.

- Dynamic 3D pathfinding for complex terrains, including path planning and smoothing, along with dynamic evaluation of environment changes
- Large-scale AI solution designed to handle large crowds in wide complex environments
- Automatic generation of navigation and perception data that can be distributed and customized to include game play data, with no input terrain format or geometry constraints
- Runtime identification of key topological zones, including hiding places, surrounding spots, and opposite-flank assault access ways

- Built-in support for information sharing and dynamic team composition enabling the creation of intelligent, challenging teams of enemies or allies
- Easy customization and integration of Kynapse libraries with most game engines
- Kynapse code is reusable, and independent of any particular game engine
- Optimized for the PlayStation 2, PLAYSTATION 3, PSP®, Xbox®, Xbox 360, Nintendo® GameCube™, Nintendo Wii, and the PC platforms.

Our powerful, runtime full-body inverse kinematics (IK) solver is integrated within the game engine for dynamic, in-game character animation.



Assassin's Creed, image courtesy of Ubisoft

3ds Max is perfectly designed for game development and helped us produce tons of assets at a breakneck pace. HumanIK helped us make the game look real, and enabled us to accomplish our goal of allowing the main character to have total freedom to move anywhere within the game's environments.

— Elspeth Tory  
Project Manager for Animation  
Ubisoft

# The Autodesk Advantage

Industry-leading Autodesk Game Development Solutions complement creativity with unmatched efficiency, productivity, and interoperability.

Autodesk continues to develop its suite of game development tools to meet the creative and technical demands of today's production environments. The latest releases help artists and technicians at the world's leading game development facilities collaborate to create, animate, and integrate more fluidly.

**Autodesk 3ds Max** 3D modeling, animation, effects, and rendering software is a tool of choice for developers looking for out-of-the box productivity. With a robust toolset and highly functional yet easy-to-learn workflow, 3ds Max continues to be a favorite among game professionals. Learn more at: [www.autodesk.com/3dsmax](http://www.autodesk.com/3dsmax).

**Autodesk Maya** 3D modeling, animation, effects, and rendering software is a tool of choice for those in the game industry who desire a high level of control over game developer workflows and pipelines. An industry-leading, production-tested software package, Maya enables game artists to produce unparalleled, world-class 3D content. Learn more at: [www.autodesk.com/maya](http://www.autodesk.com/maya).

**Autodesk Mudbox** software is a premier digital-sculpting and texture-painting solution for today's challenging productions. The intuitive, familiar user interface and high-performance, creative toolset empower modelers and texture artists to create highly realistic assets for games. Learn more at: [www.autodesk.com/mudbox](http://www.autodesk.com/mudbox).

**Autodesk MotionBuilder** software is the foremost real-time 3D character animation software solution for game production. This powerful software focuses on workflow efficiency to streamline the character animation pipeline. Motion editors and keyframe animators can take on the most demanding, animation-intensive projects. Learn more at: [www.autodesk.com/motionbuilder](http://www.autodesk.com/motionbuilder).

**Autodesk HumanIK** animation middleware consists of a runtime full-body inverse kinematics (IK) solver, as well as a dynamic retargeting engine. Integrated within the game engine, HumanIK enables compelling in-game animation, unlocking the potential for truly innovative next-generation game play. Learn more at: [www.autodesk.com/humanik](http://www.autodesk.com/humanik).

**Autodesk Kynapse** middleware is the world's leading artificial intelligence solution for games. This unique, high-performance AI engine supports complex dynamic 3D pathfinding, topology analysis, team co-ordination, and delivers efficient tools that automate production. Learn more at [www.autodesk.com/kynapse](http://www.autodesk.com/kynapse).

**Autodesk FBX** technology is a family of tools, SDK, plug-ins, and viewer, as well as the .fbx file format, that offers a comprehensive data interchange solution. FBX technology is designed to enable workflows built around multiple 2D and 3D digital content creation applications, helping to break through data compatibility barriers. Learn more at: [www.autodesk.com/fbx](http://www.autodesk.com/fbx).



High polygon count models from an organic modeling solution like Mudbox can easily be imported into 3ds Max and Maya.

3ds Max gave Gearbox Software the real-time tools required to develop Hijacker.



Image courtesy of Gearbox Software

With HumanIK, the character behaviors we created remained intact when exported to the video game engine. That was a huge benefit; it eliminated the usual time-consuming and costly tweaking and toggling between the development software and the game engine. Autodesk HumanIK is the ideal solution for our next-generation game development.

—Glenn Entis  
Chief Visual and Technical Officer  
Electronic Arts

#### **Autodesk Consulting**

Overcome specific production challenges and keep your competitive advantage. The Media & Entertainment practice in Autodesk Consulting provides game development facilities with custom technology, pipeline extensions, support, and more. Autodesk Consulting can help take your organization from where it is, to where you want it to be. To learn more, visit [www.autodesk.com/consulting](http://www.autodesk.com/consulting).

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#### **Autodesk Developer Network (ADN)**

Custom-fit your animation software with third-party applications from Autodesk authorized developers. For more information, visit [www.autodesk.com/partnerproducts](http://www.autodesk.com/partnerproducts).

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