

3ds max™ 4

3ds max™ is the world's best selling professional 3D modeling, animation and rendering software, delivering a unified, object-oriented platform for artists creating visual effects, character animation and next generation games. Since its introduction in 1996, **3ds max** has been the recipient of more than 65 industry awards and is the 3D tool of choice among more than 140,000 3D artists using Windows®.

3ds max 4 delivers CG professionals with advanced tools for character animation, next generation game development, and visual effects production. Numerous key new feature additions and architectural enhancements compliment these three major initiatives, making **3ds max 4** an ideal tool for the 3D animation industry. A highly tuned animation system allows artists to bring their ideas to life with the most advanced tools for modeling and animating characters. Version 4's state of the art interactive graphics, approachable extensibility, next-gen modeling tools and truly open architecture make **3ds max 4** the premiere 3D content creation tool for next generation game development such as Microsoft®'s X-Box and Sony Playstation® 2 platforms. An interactive and photo-realistic ActiveShade render engine, customizable and production proven network rendering system, and tight post-production integration with **combustion™** - Discreet's desktop 3D compositing software - makes **3ds max 4** the most efficient and productive tool for film and television visual effects. **3ds max 4** also can utilize other advanced renderers like mental ray® and RenderMan for distinct rendering capabilities like global illumination, caustics and distributed rendering.

features

- New open IK system designed around an extensible architecture
- New Hierarchical Sub-Division surfaces delivers next generation modeling
- New flexible IK independent shaded Bones system for more accurate skeletal setups, previews and skinning.
- Enhanced Character Deformations including new angle deformers and soft body characteristics
- Superior interactive rendering with blazing speed and free customizable network rendering
- Next generation game development environment with support for Direct3D, multi textures per face, opacity mapping, true transparency and pixel/vertex shaders like reflection maps and bump maps
- Intuitive, customizable user interface for creating a workspace to fit the task, need, or preference.
- Integration with Discreet's desktop 3D compositing and paint software, **combustion**

- **architecture**

- Multi-threaded throughout for superior performance and scalability
- Consistent unified environment provides speed and efficient workflow
- Create, model, texture or render in whatever context or point-in-time is most convenient for your scene
- Object oriented architecture provides powerful, easy to learn, consistent methods and operations, selection-sensitive commands and operations, intelligent cursors and menus, and shared class references
- Full scripting throughout the core level
- Immediate feedback for rapid artistic decision making
- Modeless design conveys immediate results across all views as you adjust parameters
- Interactive viewport graphics support OpenGL and Direct3D hardware acceleration, or fast Heidi ® software for any Windows display
- Animate virtually anything by clicking on ever-present Animate button
- Create key frames when adjusting nearly any parameter or geometry
- New Point Cache Modifier allows animators to cache or save animation data from the modifier stack, improving performance for previews and final animations.
- Controller-based animation provides parametric control over interpolation methods of nearly any value
- Controllers can be layered, blended, scripted, copied, referenced or instanced
- Flexible procedural modeling stores decisions as long as required
- Easily revisit, rearrange, remove, copy or instance modeling operations within or between objects at any time
- True referencing architecture allows reference objects, derived from master objects, to have modeling operations while sharing instanced history
- Individual modifiers, materials, maps, and animation controllers can be instanced for sophisticated relationships

- **viewport interaction**

- Custom viewport arrangements of any orthographic, axonometric, perspective, camera, light, grid, or current spline views
- An interactive rendering ability includes viewing multiple textures, blended true transparency opacity maps and reflection maps per face yielding more realistic previews directly in the viewport.
- Advanced dual plane technology for superior interactive performance
- Full hardware support for multiple textures
- Independent control of display quality, background images, default or scene lighting and ghosting
- Choice of coordinate systems for all creation, transform, and modeling operations in either view, screen, world, local, chosen object, grid, or parent space
- Transform any selection about any point according to any coordinate system
- Interactive axis constraints and modeless keyboard entry supported
- Direct manipulation provides interactive control over scene transforms and procedural modeling operations
- Independent backgrounds per viewport can be animated, with optional locked zoom, pan, and virtual zoom for precise rotoscope alignment
- Heads-up, interactive 3D snap system with more than 20 snap types
- 3D array system with complete transform, time, path, and spacing options
- Align system for positioning selections according to extents, pivot, view, face normal, or resulting highlight
- Selection methods include pick, fence, rectangular and circle with object class filters, select-by-name, named selection sets, mesh extents, backface exclusion, polygon boundary, smoothing, material, and face normal angle
- Procedural selection with volume and explicit selection modifiers
- Organization methods include named object and sub-object selections, groups, nested grouping, with hierarchy selection and navigation tools
- Schematic view for controlling scene, object, modeling, and material hierarchies and relationships

- **materials and mapping**

- Combine an unlimited number of textures to give ultimate control over materials
- Material/Map Browser portrays material hierarchies with navigable thumbnails and drag-and-drop assignment
- Shaders provided include anisotropic, Blinn, Oren-Nayar-Blinn, Phong, metal, multi-layer, and Strauss with independent sampler options
- Over 30 procedural 2D and 3D maps provided
- Multiple UVW mapping with up to 100 mapping channels per vertex, and unlimited planar object or world map layering per face
- Vertex colors can be painted, tinted or derived from scene lighting and shadows
- Mapping projections include procedural, planar, cylindrical, spherical, box, face, shrink-wrap, world-XYZ, camera, screen
- Project NURBS mapping onto mesh surfaces
- Interactive UVW editing controllable per material map and object assignment
- Direct manipulation of texture vertices with extensive UVW Unwrap tool
- Increased workflow when using Sub Material Order by new sort and preview functions

- **creation and modeling**

- Interactive creation about any point, in any context, on any face, at any frame
- No limits on geometry/scene size or number of objects, cameras, lights, materials, maps, modeling history, or rendering effects
- Choice of modeling with extensive set of 2D and 3D primitives that can remain parametric or convert to any other base geometry
- Relational NURBS modeling creates curves and surfaces which maintain design intent through manipulation and animation with choice of point or CV curves and surfaces
- Adaptive surface approximation with analytical normals delivers perfectly smooth results with separate control for base, trimmed, and displaced surfaces
- Interactive display in iso-curve and/or mesh approximation
- NURBS surfaces include point and CV, u-loft, uv-loft, blend, n-sided blend, offset, extrude, fillet, lathe, ruled, cap, 1 rail, 2 rail, trim, and multi-curve trim

- **creation and modeling (continued)**

- NURBS curves include point and CV, fit, offset, chamfer, fillet, and surface-surface intersection, surface edge, iso, curve on surface, and projected with trimming control
- New advanced spline-based patch modeling with patch, extrusions, beveling, welding edges, vertices, and more, allowing complex character creation or primitives to patches conversion for direct manipulation
- Improved Patch mapping with editable spline and simultaneous end result viewing
- Soft Selections in Patches and Splines for greater surface control
- Support vertex colors, Illumination and alpha within Bezier knots for Next-Gen game title production
- New for Patches: surface modifiers like Relax, UVWUnwrap, UVWMap, Material, etc and sub-object selection modifier for greater control of the surface properties
- Extensive tools for direct or procedural modeling, including options for local subdivision, extrusion, beveling and separate resolutions for viewports and rendering
- Enhanced angle deformers including Joint, Morph and Bulge allowing for control over complex bending shapes during animation.
- Enhanced Flex supports soft body dynamic features as well as Collision detection for realistic dynamics
- Integrated particle systems deliver interactive feedback of unlimited particle types
- Extensive particle behavioral control including inter-particle collision, meta-particles, snow, spray, bubbles, explosions, spawning, and trails which support dynamic reactions with forces and object collisions
- Hierarchical Sub-division surfaces providing state of the art local subdivision, local smoothing, wavelet-based surface approximation, breakthrough refinement features, trimming, and a hierarchical approach that sets the bar for entertainment modeling and introduces an innovative approach to interactive geometry

- **creation and modeling (continued)**

- Complete tool sets for modeling splines, polygons, polygonal mesh, Bezier patch or relational NURBS Surfaces in direct or procedural mode
- New scriptable polygon modeler complete with smoothing groups, mapping channels, vertex colors, new custom face data as well as Polygon "proof" tools for seeing the scheduled tessellation, influence it and quickly identify non-planar polygons.
- Procedural modeling is modifier based, storing decisions in editable history
- Modifiers can include gizmos for direct manipulation on parameters for fast and efficient workflow
- Rapid mesh modeling in either explicit or procedural modes with extensive set of vertex, edge, face and polygon tools that include cut, chamfer, bevel, divide, slice, planarity control, interactive normal flipping, and local tessellation
- Enhanced MeshSmooth NURMS provides intuitive subdivision surface modeling with modifiable points, vertex and edge weighting, and interactive control of mesh levels for infinite control over the surface manipulation.
- Polygon optimization with surface property preservation, separate levels of detail, and edge length control

- **animation**

- New extensible IK architecture with swappable solvers for easily choosing the right solver for the job.
- History independent, History Dependent and Limb solvers extensible with 3rd party alternatives for quickly creating animations with predictable results
- Open source two-Bone IK limb solver that can be modified and used in **3ds max** or in a games engine
- FK/IK snapping for easy transitioning during the animation, between key framed animation and IK solvers providing complete freedom in designing character movement.
- Controller-based parametric animation gives complete control over interpolation methods and behaviors
- Animation controllers provide choice of evaluation method for any animated value (60+ provided)

- **animation (continued)**

- Controllers can be layered, blended, scripted, referenced or instanced
- Advanced animation controllers include Reactors for event-driven animation, Blocks for reusing animation clips in nonlinear fashion, Expressions for establishing dynamic relationships between parameters, Scripts for
- New Bones sub-system provides a fast flexible creation of a skeleton of a character
- Auto Bone function quickly converts any existing hierarchy of objects into a bones structure.
- Shaded Bones provide a better definition to your characters shape and size with a unique squash and stretch ability
- Adjustable fins make it easier to determine the rotation of a bones object.
- custom relationships and Motion Capture for puppeteering
- Streamlined Constraint assignment
- New Constraint Controllers including Position, Orientation, Look-At, Path and Spring provide the flexibility and familiarity for efficient animation.
- Track Bar displays context-sensitive keys for manipulation
- Keys can be filtered for rapid decisions and edited using intuitive Bezier controls
- Track view controls every animated parameter with extensive filtering to isolate relevant data
- The Trackbar can display Audio files for matching up animations with audio.
- Bi-directional scene connection gives instant feedback
- Key management includes Bezier function curve control with layerable ease and multiplier curves, out-of-range looping, key frame reduction, sound coordination, constant velocity, text notes, time tags, time-based editing, key randomization and Key scaling and sliding for precise positioning
- Time can be tracked in SMPTE, frames, absolute, or custom FPS across NTSC, PAL, and film frame rates
- Character tools include volumetric skinning with hierarchies or splines, spring-based secondary animation, weighted morphing, FFD lattices, soft selections, and cluster control of individual vertices

- **animation (continued)**

- Inverse Kinematic (IK) supports branching hierarchies, pinned objects, six degree of freedom constraints.
- IK results can be calculated or interactive using Vector handles manipulation with ease, precedence, and damping weights
- Rigid body dynamics for colliding and sliding objects
- Schematic view of complex hierarchies
- **rendering**
- High Speed film-quality renderer provides 16-bit color per channel scanline A-buffer, with full gamma control at up to 32K lines of resolution for frames or fields
- New ActiveShade renderer interactively adjusts materials, lights and mapping, during a rendering session
- Superior scalability through multi-threading and free customizable network rendering across up to 10,000 machines
- Selective ray tracing provides fast, accurate reflections and refractions with very high recursion levels
- Advanced rendering options include photorealistic depth of field, adaptive displacement of all geometries, 2D/3D motion blur, 3D volumetric lighting, fire, explosions, smoke and fog
- Interactive motion blur for quickly editing and visualizing without re-rendering
- Single pass rendering of separate elements to be used for compositing
- Live action coordination with extensive background plate tools, camera projection mapping, precise camera matching, and 3D motion tracking.
- Interactive rendering delivers real-time photorealistic results for blur, depth of field, glow, film grain, lens flare highlights and color correction
- G-Buffer data gives images rich 3D scene data for sophisticated compositing with per pixel information for Z-depth and coverage, object and material ID, UV mapping, surface normal, background, unclamped color, sub-pixel weight, and velocity with independent layers for transparent and occluded objects
- Exclude objects from environmental affects or from being viewed by the camera but still affect the environment
- Video post manager for compositing an unlimited number of events with precise layering control and 3D scene integration

- **rendering (continued)**

- Extensible events include transitions between multiple cameras, filters, masks, input, export and devices
- Connection to mental ray rendering achieves unsurpassed image quality and physically correct ray tracing, global illumination, and caustics
- Over a dozen new anti-aliasing filters, providing different looks for rendered images including Area, Blackman, Catmull-Rom, Soften, and more
- Direct plug-in control of key rendering stages including anti-aliasing, shaders, sampling, and shadows
- **lights**
- Light types interchangeable at any time
- Light types include omni, free and target spot, free and target directional
- All light types support plug-in shadows, shadow color and density, projected images, contrast, edge softness, attenuation and decay
- Advanced controls include exclusion and inclusion lists for light and shadow,
- Ambient/diffuse/specular isolation, solar location, volumetric lighting
- Interactive glows, flares, streaks and highlights
- Support for global illumination, caustics and area lights with additional mental ray companion product
- **cameras**
- Unlimited number of industry-standard camera types with optional custom relationships
- Switch cameras between target and free
- Interactive clipping plane, dolly, FOV, grid overlay, orbit, roll, vertigo zoom, zoom and safe frame display
- Precise alignment with horizontal, vertical or diagonal field-of-view measure, and orthogonal projection support
- **extensibility**
- Open architecture provides extensibility for nearly any system component
- Plug-ins behave like core features to support any new functionality introduced
- Free bundled Software Developer's Kit (SDK) enables developers to build any imaginable application, with over 50% of total core source code provided
- Integrated scripting system mirrors SDK to provide access to plug-in parameters

- **plug-in classes**

- Object types: 3D and 2D base geometry classes, parametric objects, particle systems, animation systems, space warps, helpers
- Modeling operations: modifiers may be parametric or explicit and may behave in object or world space
- Animation functions: controllers (for parameters, matrices, or systems), motion capture devices, utilities, sound, key/time manipulation
- Image effects: layer, compositing, transition, one pass, image I/O, and interactive rendering effects
- Scene interaction: object snaps, color pickers, utilities, user interfaces, DCOM application control
- complete renderers, anti-aliasing, shaders, samplers, environments, shadows, lights, cameras, materials, 2D or 3D procedural, composite, or explicit textures
- File I/O: geometry, scene, bitmap, image device, fonts, viewer
- Interactive graphics: includes OpenGL, DirectX, software z-buffer
- **scripting**
- MAXScript object-oriented scripting language mirrors SDK to provide access to plug-in parameters
- New Visual MAXscript, for quickly creating UI elements and layouts for scripting.
- Scripting generates seamless interfaces you can launch at startup or embed in files
- MAXScript macro recording creates concise scripts in relative or explicit mode
- Plug-in scripts allow functionality to be customized to project needs
- Plug-in scripts can append to plug-ins, abstract plug-ins into alternative interfaces, or combine several plug-ins in one interface
- **workflow**
- Scenes are self-contained definitions of objects animation, and rendering choices
- External references allow scenes or objects to be referenced, leveraging 3D assets and project consistency

- **workflow (continued)**

- Layered nesting with local edits and alternative proxies supported for collaborative workflow and ease of animating immense data
- Add User Interface elements like sliders, dropdown lists, and buttons, etc., to any object, modifier or material. These UI items can be linked to parameters
- Parameter Wiring connects any animatable parameter of one object to another, making complex expression editing a thing of the past.
- Undo and Redo definable in-depth with separate scene and viewport lists
- Customizable interfaces you can load at any time include interface elements, colors, custom toolbars, buttons, tooltips, macros, and scripts
- Context-sensitive menus for fast workflow
- **system requirements**
- Windows® 2000, or Windows® 98
- Intel®-compatible processor at 300 MHz minimum (dual Pentium® III system recommended)
- 128 MB RAM and 300 MB swap space minimum
- Graphics card supporting 1024x768x16-bit color (OpenGL and Direct3D hardware acceleration supported; 24-bit color, 3D graphics accelerator preferred)
- Windows-compliant pointing device. (optimized for Microsoft® Intellimouse™)
- CD-ROM drive
- Optional: sound card and speakers, cabling for TCP/IP-compliant network, video I/O devices, joystick, midi-instruments.
- Network rendering not supported under Windows 98
- **file format support**
- Image file support for AVI, BMP, CIN, EPS, FLC, GIF*, JPG, PNG, RGB, RLA, RPF, TGA, TIF, YUV*, Photoshop PSD*, and QuickTime MOV
- Geometry file support for IGES*, PRJ, SHP, STL, VRML, 3DS, 3D ASCII Scene, Adobe Illustrator AI, AutoCAD DWG and DXF, Adobe Type1* and TrueType* fonts (*= import only)

additional information

To obtain more information about Discreet systems and software visit the Discreet web site at www.discreet.com or email product_info@discreet.com

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