What's New in 3ds Max: 3D Asset Creation for E-Commerce

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Learning Objectives

- Discover what tools are available in 3ds Max that will help build e-commerce and XR-ready 3D models.
- Gain insight into the 3ds Max product road map, and learn how to participate in development.
- Discover the challenges of asset creation for real-time rendering on the web (PC, mobile, XR) and how to overcome them.
- Learn how to align your content creation strategy with the very latest in industry and market expectations.

Description

Meet with the 3ds Max product team and one special customer guest to learn how we are enhancing workflows in modeling, texturing, asset publishing, and visualization for real-time 3D content production, with a specific focus on e-commerce applications. 3D content on the web is changing the way purchase decisions are made. From interactive models to augmented reality (AR) and virtual reality (VR), there has never been a greater demand from content creators to develop high-quality, photorealistic models on shorter and shorter deadlines. In this session, you will hear from the 3ds Max product team about what we've been up to with modern content-creation tools and asset repurposing workflows. You will also discover what we believe the future looks like and how to join the conversation.
Speaker(s)

**Brent Scannell**  
Product Owner  
Autodesk 3ds Max

Brent an innovator, a strategist, and is the member of the product management team for 3ds Max. As an expert in 3D design systems, he leads software development engineers to solve industry and market problems by connecting people with purpose. He is a liaison with open standards development forums and participates in the Khronos 3D Formats and 3D Commerce working groups, and has a particular passion for emerging technology in the e-Commerce space.

**Logan Foster**  
Product Owner  
Autodesk 3ds Max

Logan Foster is a Product Owner for 3ds Max and works as a part of the product management team to define the direction of modeling tools and asset production features within the software.

Logan has 20 years of experience in the visual design and development of dozens of digital media and game projects for a variety of platforms, with teams and clients of all sizes. More recently he brought his passion for art production and mentorship into a role of Lead Instructor at a private post-secondary college instructing and mentoring students on 3D modeling and animation.

**Brett Deacon**  
Product Owner & Senior Product Graphics Analyst  
Steelcase

Brett Deacon serves as Senior Product Graphics Analyst at Steelcase. In this role, he helps identify solutions and implement processes that involve digital visuals of Steelcase's product. With a background in 3D content creation, he previously served as a designer detailer for the Mittex Group, a design and consulting company for the tool and die industry. He has interest in business, visualizing content, data, and how these worlds collide. Finding a problem and being able to come up with a working solution that compliments every area is what he enjoys most about his work.
Case Studies in 3ds Max:
3D Asset Creation for E-Commerce

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Brett Deacon
Product Owner – Steelcase
WHY ARE WE HERE?
Steelcase initially began creating lightweight geometry to help support our Design Tools over six years ago. Since then, this geometry output has been our central hub for visualization needs inside of the company. Overtime, Steelcase has added onto this process to help support more advanced visualizations. Currently, Steelcase has been actively creating web-based visualization solutions to help service both its B2B and B2C spectrums.
SKILLS, AS WELL AS ASSETS, CAN BE REPURPOSED

e-Commerce goes well beyond tables, chairs, and linens. The needs of this rapidly emerging space are evolving to meet consumer demands, producing content that is consumable real-time on the PC, in AR, or on mobile devices. With a wide range of target platforms producers are turning towards real-time workflows and best practices that have already been established in the games development to produce this content and to do so at the highest quality possible. The only true limit is your imagination.

As we continue to evolve 3ds Max we are constantly working towards making this process faster, better, and more productive, empowering artists to be artists, regardless of industry or platform that they are working for.
AGENDA

CASE STUDY 1: THE AU SNOWMOBILE
How a production ready model was brought into an AR demo for mobile

CASE STUDY 2: THE STEELCASE DESIGN PROCESS
Converting Engineering content to visualization content from Steelcase's perspective.

CASE STUDY 3: PHOTOGRAMMETRY TO REALTIME
Converting reality capture data through to a real-time output has never been easier with the tools available today in 3ds Max

3DS MAX PRODUCT TOUR: PAST PRESENT AND FUTURE
A quick overview of the 3ds Max release history, how to get involved with development, and what features apply to these workflows
CASE STUDY 1: AU SNOWMOBILE TO glTF

How do we take a high-resolution, production ready, asset that has been made for other Autodesk University demos and make it consumable on a mobile tablet device utilizing AR?

- A ready-made solution exists today utilizing glTF
  - Limitations and Requirements:
    - <150,000 triangles of geometry data
    - <20 draw calls
    - Textures smaller than 2048x2048

For our first case study we are going to look at repurposing the Snowmobile model, using glTF we will export this model so that it can be viewed in AR on a mobile device. This however presents a few challenges if we want this data to be interactive and performant...

- We have a limitation on the number of triangles we want to use
- We are limited to 20 draw calls. For those that do not know, a Draw Call can be best thought of "how many objects with a material are in my scene" (it is of course a bit more complicated than that when you involve lights and other data, but the easiest way to think of it is the number of objects. Draw calls are the single most limiting factor of any piece of rendering hardware as it can be thought of how much can the system keep track and render efficient! On a PC we might have 2000 of these, but on mobile we have a lot less.
- We want our textures to be 2048x2048 or smaller. Mobile hardware doesn’t have a lot of VRAM, PC hardware has a lot more but it is still limited
You’ve probably noticed this wonderful Snowmobile model (created by Adrian Wise) as a part of a few other demos here at AU.

We thought it would be a great case study to take this production ready model and get it exported to glTF on a mobile device, but unfortunately the model is well beyond our specs of 120,000 triangles and 20 draw calls.
This model was constructed smartly and we can make some simple changes to it to make it ready for real-time with glTF. Removing the OpenSubDiv modifier and the support edge loops that are not supporting the shape/form of the model will help us get our triangle count down to 88,814 triangles. To reduce draw calls, the easiest way is to combine mesh nodes in my scene that will share the same material. This will reduce the draw calls down to 19 draw calls.
The model doesn’t need explicit textures, so we can use smaller tiling textures to achieve the look.
At this stage it will be a good idea to make any adjustments that are needed for the Uvs so that people cannot see any of the UV seams and to reduce any UV distortions that exist. Stretched or smeared looking textures will stand out.
Using the Chamfer modifier we can restore the soft / rounded look that OpenSubDiv was previously providing.
Using the Smooth modifier we can quickly defined hard edges on our model and have Chamfer only apply to those.
The new Weighted Normals modifier can then be used to help with the visual display of the model.
In the end we will get a result that is very similar to what we started with, but still meets our technical requirements.
As the last step we will apply our materials. We can assign them using the PBR scripted Material found in 3ds Max 2021. This material will allow us to apply our PBR game style textures rapidly to our model and have a viewport output that can closely match what we will see.
Once all that is done we can export and load the data onto our mobile device
CASE STUDY 2: THE STEELCASE DESIGN PROCESS

How does Steelcase get to a finalized product that is ready to be used for visualization across the entire company?

- Steelcase's has a standard creation pipeline to create visualization ready assets.
  - Geometry Creation: Engineering to Visualization.
    - Limit polycount for performance.
    - Meeting "Steelcase Standards"
  - Material Creation: Physically Accurate Materials
    - Create high quality procedural textures.
    - Delivering content through multiple mediums.
  - Delivery: Steelcase delivers to multiple customer groups
    - Unreal Engine Visualizations
    - Configuration Based Visuals
    - Resources for users.
Our engineering models are very dense, not possible to display on the web (left). We have the modify and reduce this data (right). This is either done by reducing the data or rebuilding from scratch. If there is data we don’t need from the engineering design, we don’t keep it in our low poly output. We can increase or decrease the mesh complexity by using subdivisional surface modifier like Turbosmooth or OpenSubDiv and add support edge loops on an Edit Poly modifier to tweak the look from there.
We put a lot of care into Uvs, setting them to real world scale size helps our customers really see the materials as they will be on our products
We have a custom rig and process to capture real world materials that we then bring into the computer.
We put a lot of effort into the making the materials we capture seamless and PBR compatible using Substance Designer.
Once this has been setup we will also configure material variants (such as colors) before exporting each as PBR textures
We will then use these PBR textures and models in a game engine like Unreal or WebGL to use for a variety of collaboration methods with our customers ranging from VR to web base customizations so that the user can configure it the way that they want it to be.

2D images and high end renders are great, but having the customer configure or place it in their space gives more of a personal attachment before they commit to buying the product from us.
How can we utilize 3ds Max with reality capture data (such as photogrammetry) to produce real-time production ready assets?

- Reality capture is rapidly becoming an important method for asset creation and utilization
  - Unfortunately, reality capture data is dense, often has significant mesh data errors, and isn’t easy to edit or use as it is
  - We should always aim to be efficient and optimal in our work
    - We need to re-mesh this 3d data to something low poly
    - We need to capture the high resolution mesh information as texture data
    - We want to use the captured diffuse data from the photo
  - Accomplish this as simple as possible (art should be fun)

Reality capture is an important part of the asset production pipeline for real-time workflows, generating not just 3d data, but textures, and other useful information that adds realism that we cannot artistically create. However, this data is often dense and can be a huge mess to try to work with or edit.
Using my smartphone I captured 44 images of this cool looking retaining wall I came across. Using ReCap Photo the photos were converted to 3D information (photogrammetry).

This particular project started because I was out for a walk and came across a large stone retaining wall that I thought looked really cool. Photogrammetry is hobby of mine, and for this project I used my smartphone to capture a portion of the wall in photos. The keys I have found are lots of overlap between your photos (~50%) and to not introducing perspective with your shots. With the images captured I headed home and used Recap Pro (though Metashape, 3dZephyr, Meshroom, and other similar to it would work well too) to process the data. This is the longest step in the entire process.
Once you have your photogrammetry data generated import it into 3ds Max, fix the alignment and remove what you do not need. This can range from cameras to unnecessary mesh data. Fixing holes that the photogrammetry process missed will be important to do as well.
With over 1.5 million triangles of data we need to decimate the data. ProOptimizer can help bring this mesh data down without destroying the overall shape/form. Using the Autodesk Retopology Tools for 3ds Max we can process this data back into clean quads with good edge loops. Once completed we have 50,000 polygons of data. Using our Weighted Normals cleans up the meshes visual display and prepares the model for baking textures later.
To capture data from our high resolution model as a texture information we need good UV coordinates.
Use the Projection modifier, which will do raycasing along the explicit normal to find hits (this is why Weighted Normals was important) and reimport the high resolution mesh
Quickly setup the new Bake to Texture tool in 3ds Max 2021 to quickly generate bitmaps. Capture a normal bump map from the high resolution mesh and also use the messy Diffuse texture from the photogrammetry capture to generate a clean output based on the Uvs created.
Using the PBR material apply the generated textures onto the low poly model. Using the HDR Environment material as an IBL environment light you can review your model and make any necessary changes. Export and enjoy.
Please see the roadmap video or visit http://makeanything.autodesk.com/3dsmax for the public roadmap
We are constantly connecting with our users in various ways, to learn what are the challenges and needs:
- Various conferences and events
- Inside the factory: connects developers and customers, once a year in Montreal office, and deep dive on users’ challenges
- Community:
  - Beta community: 1k users, not particularly about testing the software for quality, but a chance to participate in the design, directly connected to the dev team
  - [https://feedback.autodesk.com/key/3dsMaxBetaApplication](https://feedback.autodesk.com/key/3dsMaxBetaApplication)
  - Ideas: submit your ideas, vote on others submissions, this is considered in the prioritization process for the product as demonstrated later
  - AREA: Share your artwork with the larger community, we’re also looking to start including user artwork from the AREA in our Welcome Screen
- Public Roadmap: Starting with 2020, updated public roadmap published with each release, so you know where we’re going
  - [http://makeanything.autodesk.com/3dsmax](http://makeanything.autodesk.com/3dsmax)