

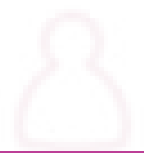
KUESA™ 3D Studio

The Complete Design-to-code Workflow Solution for 3D Assets in Real-time Applications



designers

KUESA™



developers

Building software that is dependent on real-time 3D models – be that an automotive dashboard, MRI machine, factory control system, or furniture design tool – requires not only 3D designers and 3D programmers, but the ability to bring these very different skillsets together into a smoothly operating workflow. A massive problem here is that the assets created by 3D artists can rarely be used by programmers directly, forcing the

development team to hand-tweak models and hand-code animations to make things work. It also forces designers to move their designs to target hardware in order to see how they'll actually appear. This manual work extends product release timelines, and the artificial wall it creates between 3D artists and software engineers is a bottleneck that all but eliminates rapid iteration and the fine-tuning required to create high-quality products.

KDAB specifically created KUESA™ 3D Studio to eliminate this problem. KUESA 3D Studio makes for an easy, integrated workflow, bridging the gap between designers and developers. Designers can realize their vision using the tools they are experts in, developers can focus on their strengths without having to deal with design issues, and management can rely on getting better products to market faster.

GL Transmission Format (glTF)

glTF is a common publishing format for 3D content, tools, and services built using the JSON standard. It is published and maintained by the Khronos Group, the organization responsible for Open GL, Open GL ES, and Vulkan standards. The glTF format is optimized to handle real-time 3D both in size and runtime processing requirements.

KUESA 3D Studio uses the standard glTF format with glTF-aware digital content creation plug-ins, extensions, and applications to streamline the designer-developer workflow and efficiently share 3D assets between all tools in the design toolchain.

KUESA 3D Studio versus other approaches

There are traditionally two main ways to integrate real-time 3D content into an application:

Workflow	Description	Drawbacks
Double-work	Designers create videos of scenes and developers recreate them in code	<ul style="list-style-type: none">• Creates unnecessary team overhead, communication, and work• Introduces translation errors and provides suboptimal results• Makes editing assets extremely difficult, which inhibits UX refinement and iteration
Extra-step	Designers and developers use a common-denominator tool, editing scenes for integration into an application	<ul style="list-style-type: none">• Limits the creative process and application functionality to the constraints of a less-powerful tool• Designers and developers require retraining on unfamiliar software• Restricts knowledge, debugging, and adaptation through black box software that cannot be modified

What makes KUESA 3D Studio better?

For designers – KUESA 3D Studio has seamless plugins that allow designers to use familiar, professional 3D design tools such as Maya, Autodesk 3ds Max, and Blender (and other glTF compatible digital content creation tools) to create 3D scenes and animations. These professional-level tools also give designers additional capabilities like physically-based rendering (PBR), and objects with fully animatable and code-accessible properties for nearly every aspect of the object's appearance: geometries, cameras, materials, lights, and objects. Not only can designers build consistently photo-realistic 3D objects for their application, they can also fully specify how these objects behave and interact within a virtual environment.

For developers – Developers can use KUESA 3D glTF Library to directly import designer-created and fully capable 3D objects into an application. They give the objects life by connecting behavioral logic to designer-specified animation triggers. Because all asset properties are accessible – from the attributes of displayed objects to the details of the rendering pipeline – developers can use the full power of the Qt 3D API to change and fine-tune the appearance of a 3D scene. With a wealth of tools within KUESA 3D Studio, designers and developers are able to inspect, preview, condition, sanity check, debug, profile, and optimize a project's 3D assets. Because no custom software, data tweaking, or hand-coded animations are required, KUESA 3D Studio makes it easy to deliver applications with highly optimized 3D models that can be simply integrated and updated as often as needed.

For teams – The KUESA 3D Studio workflow makes it much faster for teams to get beautiful 3D assets working in production products. Not only does this shorten development time but, because rapid cycles become painless instead of painful, it is far easier to try out design tweaks and UX tests to ultimately create a more finely tuned product. KUESA 3D Studio uses the open standard glTF format for data exchange so it works well with current design tools, is future-proofed against new ones, and prevents vendor lock-in.

KUESA 3D Studio components

KUESA 3D Studio is comprised of three main components:

- **KUESA 3D Design Plugins** – plugins that augment a designer's preferred digital content creation tools, allowing designers to create and export fully accessible 3D scenes and to display content that visually matches the run-time environment
- **KUESA 3D Tools** – many additional utilities for fine tuning, conditioning, investigating, debugging, and optimizing 3D assets, usable by either designers or developers
- **KUESA 3D glTF Library** – libraries built on top of Qt and Qt 3D that allow developers to integrate 3D scenes into applications. KUESA 3D glTF Library is built on-top of the widely popular Qt 3D framework. As KDAB is the originator and maintainer of Qt 3D, we know how to wring every ounce of performance from it, providing great performance on both desktop systems and embedded boards

KUESA 3D Studio capabilities

- Support for Maya, Autodesk 3ds Max, and Blender, as well as any other glTF-compatible digital content creation tools
- Ability to build 3D scenes with PBR, non-PBR, and node-based materials
- Real-time performance on desktop and embedded systems
- Integration of both 3D and 2D assets
- Compressed textures, meshes, and images for faster load times, reduced application size, and optimal use of GPU resources
- Full programmatic access to scene items with APIs in C++ and QML
- Photo-realistic results consistent across design tools and applications
- Special effects like bloom and depth-of-field
- Up to date with Qt 3D performance improvements in Qt 5.15
- Ability to incorporate tools into a continuous integration system resulting in consistent 3D asset verification and conditioning.

Physically Based Rendering (PBR)

PBR is able to approximate the appearance of real-world objects by considering the scientific properties of materials (such as albedo, conductivity, and microfacets) while still rendering objects in real time. KUESA 3D Studio developers can use PBR so that materials in the 3D design tool and engine are displayed identically with photo-realistic results.

Iro Material Library

Physically based rendering can generate amazing images, but not all embedded systems have enough processing power to handle it. Plus, without knowing the actual physics, PBR isn't easily tweakable to simulate materials such as a pre-defined bitmap that needs to appear glossy. For these cases, or any other where PBR may be overkill, KUESA 3D Studio supports the Iro Material Library. This KDAB library provides a catalog of materials that can simulate common surface properties (such as reflections, clear-coated paint, and transparency) and gives great looking results with less designer and GPU overhead.



For more information

KUESA 3D gITF Library is available under commercial and open source licenses, with source code available in public GitHub repositories.

To find out more about KUESA 3D Studio and see videos of KUESA 3D Studio in action visit www.kuesa.com

KUESA™ 3D Studio is available under a commercial license with a 30-day free trial. To arrange for KUESA 3D sales, training, workshops, or support, contact us:

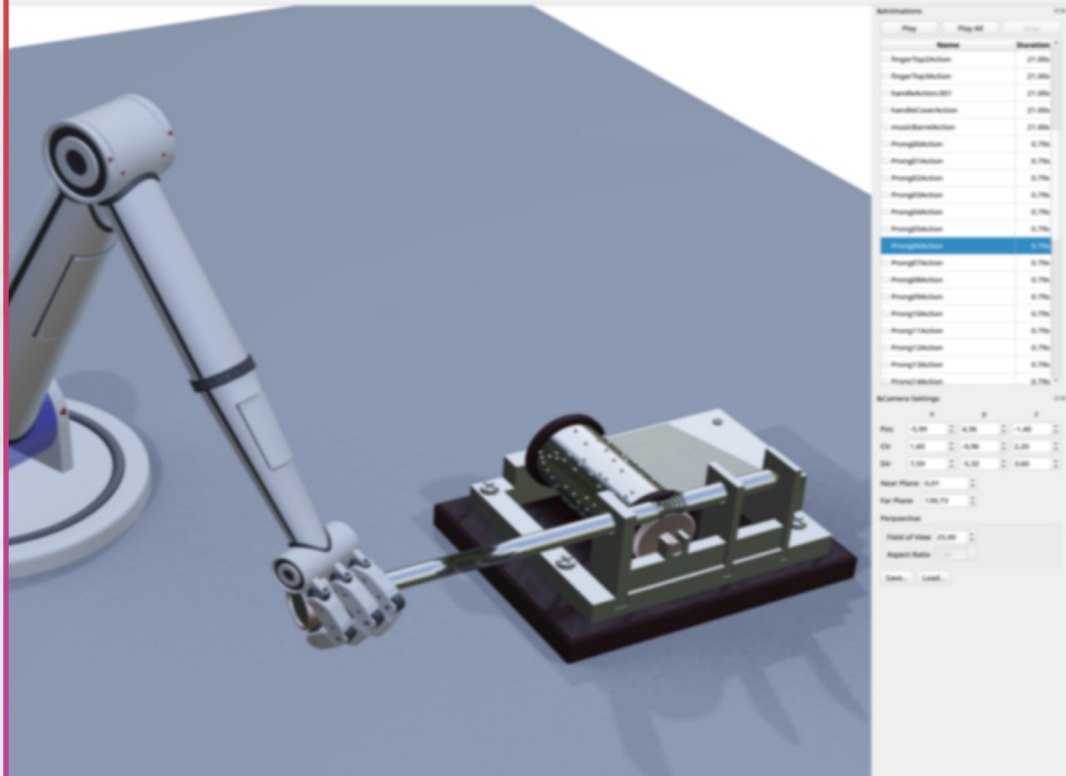
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KUESA 3D Studio: flexibility meets power

Some solutions take away from the abilities of designers by forcing them to relearn and use a limited proprietary tool, restrict what programmers can accomplish within their framework, and in many cases both. Having helped many companies solve these problems, we know the pain, inefficiency, and delays this architecture can cause. KUESA 3D Studio is our response: an open and extendable solution that won't lock you into someone else's product, and is architected to use already existing best-in-class tools to their full advantage.



www.kdab.com

About the KDAB Group

The KDAB Group is the leading software consulting, development and training provider for Qt, C++ and 3D/OpenGL. Since 1999, KDAB's unique software expertise has helped thousands of customers to improve quality, productivity and time to market across desktop, embedded and mobile platforms. Our customers - several from the Fortune 500 list - are active within Automotive, Biotech, Medical, Industrial Embedded, Entertainment, Government, Consumer Software and other innovative sectors. We take great pride in delivering our projects successfully, on time and with high quality. In 2020 the KDAB Group had 90+ employees across Americas, Europe and Asia. The main offices are in Germany, France, the UK, Houston, TX (USA) and Sweden.

