

What is Digital Geometric Kernel

DInsight

We describe here concept and market positioning of DG Kernel product developed at DInsight.

DGK is a software development component, which enables 3D geometry manipulation in Windows applications.

DGK is not a CAD software. It is rather a building block for custom [Digital Geometry](#) (DG)-enabled applications. Instead of being another generic design software, DGK aims at building business-specific applications, where developers can replace complexity of 3D object manipulation with simple tailored User Interface.

As the result, end users of DGK-based applications do not have to know anything about CAD to modify the presented product.

The target consumers of DGK are software developers and/or engineers who are not proficient in CAD. They are rather developers who need some CAD/DG functionality and limited time to learn CAD complexities. The assumption is that the developer would have less than 5%-time budget during a project development life cycle for learning DGK.

This forces two design options: The software has to be high level. The interface should be familiar for developers.

The later has led us to decision that on top-level the component should be a control, which can be added to forms or dialogs without any complicated window creation procedure. For advanced users there are more options, including using DGK as a background geometric engine.

Repeating briefly, we assume that the end user will know nothing and the software developers will know only a little about DG/CAD.

There are other options for developing CAD-enabled applications. The numerous CAD systems are based on a limited number of CAD kernels. Strictly speaking CAD kernels are powerful tool for creating DG-enabled application.

DG Kernel differentiates itself in a number of ways. An important one is cost. A single license for a commercial kernel like ACIS or Parasolid costs over 100,000 USD. The only viable free alternative, Open CASCADE, implies significant investment of time and effort into learning the technology, which is quite complex even for a seasoned C++ developer.

DG Kernel integrates Open Cascade internally, but presents the functionality in a much simpler and modern high-level interface similarly to .NET or Java in programming.

It is also possible to develop 3D-enabled applications using 3D graphic APIs like DirectX or OpenGL, but exceedingly this is considered too low-level development to be productive for most of projects.

There are also numerous higher-level graphics engines like Unity 3D, Blender, Ogre. These are mostly aiming at games and at working with meshes. Parametric modelling and operations are out of their scope.