# Digital Geometry vs CAD

DInsight

Traditionally Computer Aided Design means computer - assisted drafting. Although it does not involve a ruler or compass, it is a human activity, which means it is essentially a manual work. Somebody has to click menu options. draw lines, execute operations, etc.

Digital Geometry (DG), on the other hand, is computer-generated geometry. It is geometry, in form of 3D objects and models, created programmatically by software. In other words, Digital Geometry is a fully programmable (smart) CAD.

Digital Geometry is unavoidable in many processes. One example is simulation of CNC grinding, used in manufacturing of metal cutting tools. In the case, the surface is constructed as a subtraction of a swept volume generated by 5-axes movement of a grinding wheel. This kind of surface can not be defined directly, as the equations are unknown. The surface has to come from a complicated algorithm.

Output of Digital Geometry is intended to be consumed by another software. Because of this, in the current technology, Digital Geometry has to come either in form of a kernel or, to a smaller extent, from a web service.

There is a division between CAD systems and CAD Kernels. There are numerous CAD applications (https://en.wikipedia.org/wiki/Computer-aided_design) based on a small number of CAD kernels. We believe CAD Kernels should be considered as part of Digital Geometry, which targets CAD systems. Targeting CAD systems does require significant specialisation.

Digital Geometry is intended to be used in applications targeting a certain business. For an example, in the tool grinding, the simulation application does not have to serve as a generic modeller. Instead it hides the complexities of geometry and expects human input in form of familiar to the industry parameters and options.

The functionality required for such an application it too specific for a general CAD kernel also. In our view it has to be provided by a specialised DG software.