

OpenGL (*Open Graphics Library*) is a [specification](#) for a multiplatform and multi-language [programming interface](#) for the development of 2D and 3D [computer graphics applications](#). The OpenGL standard encompasses approximately 250 commands that allow for [real-time](#) rendering of complex 3D objects. [Proprietary](#) extensions may also be defined by other organizations (generally graphics card manufacturers).

The OpenGL API is normally [implemented](#) using [system libraries](#), and is also part of the graphics card [drivers](#) on several operating systems. These execute [graphics card](#) commands as appropriate. In particular, functions not available on the graphics card must be emulated by the CPU.

As of 2014, OpenGL is no longer under development, having been replaced by the [Vulkan API](#).

Programming model

Many parameters may be adjusted to influence the display of [rendered](#) objects. Objects can be [textured](#), illuminated, stretched or moved; they can be transparent or opaque; and they can be given a rough or smooth surface.

OpenGL was designed as a [finite-state machine](#) that does not receive all necessary parameters with each function call, but instead uses the same value until the corresponding state is changed. For example, it is not necessary to pass the desired colour to OpenGL for each [vertex](#) , simply to set a colour once, after which all the following vertices will be set to that colour. In the same way, light sources can be enabled and disabled globally and many other states can be set.

This design was intended to avoid, whenever reasonably possible, the time-consuming reconfiguration of the [graphics pipeline](#) required by almost every change of drawing mode. It would also be tedious for the programmer to enter dozens of parameters each time. Several thousand vertices can often be processed before a state must be changed, while some states never need to be changed. For instance, the light sources for all the objects in a scene usually remain the same. Many states are retained at least until a complete object has finished rendering. For example, a car is translated about a vector as a whole, rather than being divided into its individual components which are translated separately. This condition-based concept is also used in [Direct3D](#).

Original

Extract from Wikipedia article 'OpenGL': <https://de.wikipedia.org/wiki/OpenGL>