Domain Track Status – Computer Graphics

What does quality mean in your selected domain?

Quality in computer graphics is determined by visual aesthetic, resolution, and rendering time. In both still images and animations, customers have high expectations for how accurately the graphics depict reality. Rendering time is not as much of a concern with still images, but is crucial to animations that must render several images a second. When the rendering time for each frame is too slow, the motion in animations becomes jerky and unstable. This delay in updating the frames is referred to as lag, and has perhaps the most egregious effect on customers’ opinions of graphics, particularly in games.

What are the important factors?

Rendering algorithms are the most significant factor in computer graphics. Two of the most common ways to render graphics are ray tracing and radiosity. These algorithms, because of their differences in implementation, can produce different results and artifacts (errors in the image) when rendering the same graphic. Thus, the algorithm chosen to render a graphic depends on the purpose of the graphic. For example, a slower but highly detailed algorithm might be appropriate for medical graphics, where the images are rendered prior to being displayed. On the other hand, a faster but less detailed algorithm might be appropriate for a video game, where images cannot be rendered prior to being displayed due to their dynamic nature. In this scenario, the number of frames rendered per second is more critical than the exact details of the graphics and necessitates a faster algorithm.

What processes are currently used?

Although time consuming, the most effective process of measuring graphical quality is via visual analysis, by both developers and customers. Visual analysis by the developers takes place to ensure some level of quality prior to releasing a product to customers. Developers also track resolution and frame rate, two quantifiable metrics that guarantee some level of quality. But in the end, customer opinions matter the most, and many companies have employed detailed processes for gathering customer feedback. These processes often involve releasing a limited number of trial versions during development to gather customer feedback before making a product publically available. The sooner customers look at the graphics, the sooner improvements can be made to the graphics.