Time-of-Flight Cameras in Computer Graphics

A growing number of applications depend on accurate and fast 3D scene analysis. Examples are model and lightfield acquisition, collision prevention, mixed reality, and gesture recognition. The estimation of a range map by image analysis or laser scan techniques is still a time-consuming and expensive part of such systems. A lower-priced, fast and robust alternative for distance measurements are Time-of-Flight (ToF) cameras. Recently, significant advances have been made in producing low-cost and compact ToF-devices, which have the potential to revolutionize many fields of research, including Computer Graphics, Computer Vision and Human Machine Interaction (HMI). These technologies are starting to have an impact on research and commercial applications. The upcoming generation of ToF sensors, however, will be even more powerful and will have the potential to become “ubiquitous real-time geometry devices” for gaming, web-conferencing, and numerous other applications. This STAR gives an account of recent developments in ToF-technology and discusses the current state of the integration of this technology into various graphics-related applications.

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