3D Displays for Design Engineering

Design Engineering is a discipline that bridges the gap between the inventor and the manufacturer. The task of a design engineer is to make sure that the envisioned product functions are realized while minimizing the usage of resources. In recent decades, the development of Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) systems boosted design engineering productivity. With the constant increase of computer capabilities, 2D product drawings have been progressively replaced by 3D product models.

The main advantage of 3D product models is that they offer a more realistic view of the final product compared to 2D drawings. Current research aims to further improve the engineering productivity by utilizing 3D techniques for visualization. 3D product models are presented in 3D space instead of on a flat computer screen, thereby improving realism and perception.

One of the promising enabling technologies in this area is a holographic display technique. Being an autostereoscopic technique, multiple viewers (engineers) can simultaneously view the product model in 3D with each having their personal view. This is a big advantage compared to stereoscopic techniques, where all viewers share the same view.

Holographic display techniques boost the spatial perception of the 3D model. It allows viewers to enter the scene with their hands and for instance grasp parts of the product virtually. Good visualization and spatial perception improve clear communication between design team members. The productivity of collaboration with distant team members can boost significantly when 3D product visualization can be overlaid on top of video conference imaging.

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