Design and Production of an Innovative, Interactive Augmented Reality Projector

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Augmented reality (AR) is a fascinating new lighting technology, where we can add virtual objects to our reality that are perceived as holograms within our actual environment. Special AR glasses are still in development. My idea was to invent an innovative daylight-optimized AR projector to make the holographic perception possible for several people at the same time with no need for glasses. My passion for CAD-construction and manufacturing was used to find a solution in which functionality and design merge into an ideal whole. Starting with numerous experiments, I finally developed a new technique that is based upon using an extremely bright beamer, deflecting light rays within the smallest area as possible, providing a diffusely scattering projection surface and avoiding scattered light by utilizing special polarization foils. CAD programs were used to construct the projector, create technical drawings and provide CAM solutions for cost efficiency. Each production step was performed on my own, being allowed to use the technical facilities of a student research centre like laser cutter, water jet and 5-axis CNC milling machine. The final step was the design of the holograms that were created with CAD construction and real-time raytracing. In conclusion, an innovative Augmented Reality projector was realized that additionally provides interactive features and a customized ergonomic working height. Current scopes of application are my CAD lecture activities for teenagers and trade shows where my own holograms are presented.

Awards Won:

Fourth Award of $500