Licensing Opportunity

Head Mounted Projection Display with Eye-Tracking Capabilities

Advantages
- Compact, comfortable and easy to calibrate
- Robust, inexpensive and lightweight
- Only minimal additions to the optical layout are necessary
- Fully integratable into established head mounted displays designs

Invention
The design of an HMD device capable of outputting eye-tracking information without the need for redundant eye imaging optics

Background
Personal displays may be used for augmented or virtual reality computer interfaces. A key factor in making this technology truly desirable is the creation of a two way exchange between user and computer. By tracking the movements of the eyes of the wearer, it has been suggested that a feedback loop could enable one to interact with the digital personal display by eye movement. Many eye-tracking technologies exist, but the implementation of such systems into head mounted displays (HMD) without loss of wear-ability has been a struggle. Moreover, some prior art techniques are undoubtedly quite intrusive for the user, and typically lack compactness, accuracy, and robustness.

To overcome these limitations, researchers at UCF developed a novel design for a head mounted projection display (HMPD) with eye-tracking (ET) capabilities. This fully integrated system is robust, inexpensive and lightweight. Compared to conventional eyepiece-based see-through HMDs, utilization of projection optics allows for reduced optical distortion across similar fields of view. It also allows for an increase in the field of view without sacrificing compactness, since the size of the optics does not scale with field of view. This novel technology enables the system to react to the user’s eye movements without an additional set of optics, and therefore, it is less complex and less costly to manufacture.

Application
This technology may be implemented into the design of HMDs that hinge on reactions to user eye movement. It can be utilized for applications such as training, simulation and human factors research.

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Selected References

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