Bi-directional OLED microdisplay for see-through HMD

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ABSTRACT

Within the research project “iStar - Interactive See-Through Augmented-Reality Display” the Fraunhofer Gesellschaft developed Augmented Reality goggles comprising a VGA OLED microdisplay with embedded image sensor aimed on gaze-control and see-through head-mounted optics. The active area of the bi-directional microdisplay consists of nested display and image sensor (embedded camera) pixels surrounded by a second image sensor (frame camera) as well as driving and control circuitry (c.f. Table). The display and image sensor systems are electrically independent of one another, simply interacting via synchronization signals. iStar also includes a developer kit integrating Eye-Tracking software, AR system and application demonstrators.

The topic of high-contrast See-Through HMDs still forms an important research topic within the AR community, thereby iStar not only offers a light-weight display solution but it also integrates camera sensors into the display to support Eye-Tracking. With the presented demonstrators the tutorial attendees can evaluate the possibilities and the maturity of the developed technologies.

The attendees will get an overview to requirements, solution possibilities and open research topics in the field of microdisplays, optics and software development for the realization of interactive see-Through HMDs. Feedback to learned objectives will be evaluated in questioners.