On-Axis Eyeglass-based Display System for Augmented Reality

Advantages
- Very lightweight and compact design
- Aesthetically pleasing as a small visible addition to a set of sunglasses
- On-optical-axis elements allow for more simple alignment than off-axis devices

Invention
The invention represents the design of a head mounted display system made of a microdisplay source, a spherical imaging mirror and a beam splitter between them. Additionally, the system is affixed to a streamline headset similar to a pair of sunglasses which displays information to one eye while leaving the other’s view unaugmented.

Background
Augmented reality is the overlay of digitally generated data and images into a live viewed scene. Dreamed up long ago in science fiction literature, this technology has recently become one of great promise. As the human mind becomes more adapted to interactions with computers, and displays become the size limiting element of electronic devices, the development of personal display systems is becoming highly desired. UCF researchers have developed a system that projects images for the wearer of a pair of specially designed glasses or sunglasses. While the wearer may view the real world in front of them through one eye, the device described herein projects information in the form of images or data through an optical system perpendicular to the wearer’s line of sight and then reflects, via beamsplitter, the intended image into the other eye of the wearer.

Application
This technology provides the ability to add visual information, be it data or images, to enhance a live interaction or to create a virtual interaction and has wide reaching potential in the enhancement of human/computer interactions in general. Head mounted display developers could utilize this invention to create more aesthetically pleasing display which may have a wider ranging appeal to the general consumer market. Such a technology could be utilized for simulations training, military, rehabilitation, tourism and gaming.

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