

Tomorrow's Screenless PC

As we watch the personal computer evolve, one of the major changes that will be seen is how the computer delivers its output to the user. Most of tomorrow's personal computers will be screenless. Instead of presenting its visual data on a display screen, the screenless PC will use six tiny laser diodes to project the data directly onto the user's retinas. Three of the diodes (one red, one green, and one blue) will project data into the user's left eye – and the other three will project images into the right eye.

Retinal projectors are being developed by the Human Interface Technology Laboratory at the University of Washington in Seattle and are being further developed and marketed by Microvision, Inc. Retinal projectors offer many advantages over the flat panel and CRT displays now used with personal computers. Some of these advantages are:

1. **Lower power requirements.** The six diodes require no more than a few millionths of a watt to deliver their images to the user's eyes.
2. **Higher resolution images.** The pixels in the images projected by the diodes can be made smaller than is possible with any CRT or flat panel display, so higher resolution can be achieved. With retinal projectors the only limitation in the resolution of visual images will be the resolving power of the users' eyes.
3. **Greater portability.** The combination of diodes, lenses, and processing components in a retinal projector system will weigh only a few ounces.
4. **Wider angle of view.** Retinal projectors will be able to provide a wider field of view than is possible with display screens.
5. **Better color accuracy.** By modulating light sources to vary the intensity of red, green, and blue light, retinal projectors can provide a wider range of colors – and more fully saturated colors – than any other display technology.
6. **Greater brightness and better contrast.** Retinal projectors can provide higher levels of contrast and brightness than any other display system.
7. **Ability to present 3D images.** With their capability of presenting high-definition image-pairs, retinal projectors can deliver the most highly realistic stereoscopic movies and still pictorial images to their users.
8. **Ability to present far-point images.** The human visual system is a far-point system. With today's desktop and laptop computers users must employ their near-point vision. The excessive use of our near-point vision in using computers, reading, sewing, playing video games, etc., is making myopia a very common impediment. The use of the far-point images that can be provided by retinal projector systems could reduce the incidence of myopia and, hence, the growing need for and use of eyeglasses.
9. **Lower costs.** The present cost of retinal projector systems is high. But there are no difficult manufacturing problems in mass producing low-cost components, so inexpensive systems will soon become available. Disposal and environmental costs of these tiny delivery devices will also be minimal because toxic elements such as lead are not used in their manufacture.

See <http://www.hitl.washington.edu/research/vrd/project.html>
<http://spectrum.ieee.org/biomedical/imaging/in-the-eye-of-the-beholder>
<http://www.pbs.org/cringely/pulpit/pulpit20020530.html> and
<http://mudoc.com/hdmm.htm> for more about these advantages..