Small screen tech: First look at new smart contact lens

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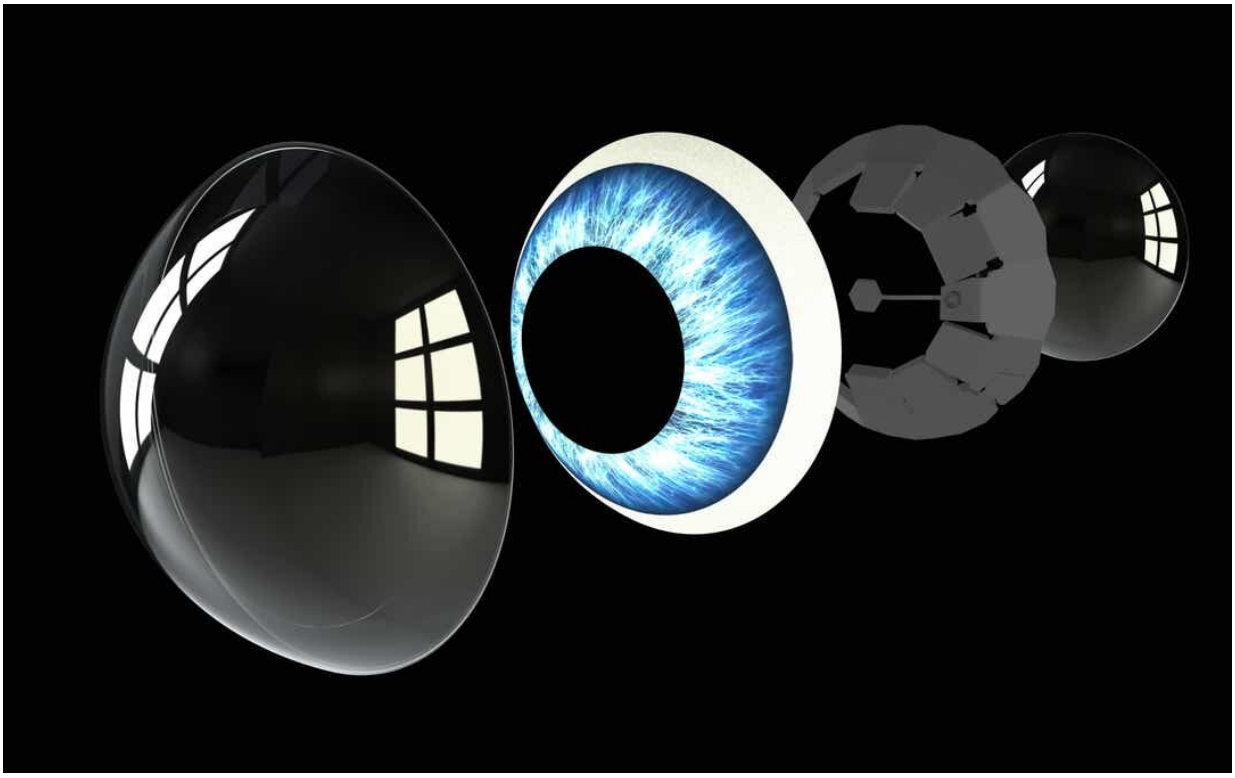

Mojo Vision lenses. Credit: Mojo Vision

The "eyes" have it—quite literally.

Someday when you walk down the street, an augmented user interface will appear like a floating screen above your real-life surroundings. You

may discreetly see your heart rate, glucose reading, a weather forecast, real-time translation or map. Or maybe the name and title of the person you're about to run into.

You might think I'm describing Google Glass or some other kind of bionic spectacles visible to the outside world. What you're wearing instead is something way more inconspicuous and straight out of "Mission: Impossible—Ghost Protocol"—a pair of smart corrective contact lenses that you can control with subtle eye movements and gestures.

In an off-site hotel room during last week's CES trade show in Las Vegas, I was treated to an early demonstration of Mojo Lens, billed as the world's first "true smart contact lens." (The Defense Advanced Research Project Agency or DARPA has reportedly shown interest in a smart contact lens developed by the IMT Atlantique engineering firm in France.)

The patented lenses are still a prototype under development, from a venture-backed Silicon Valley startup called Mojo Vision. One of the lead investors is Google's Gradient Ventures; Google parent Alphabet had worked on then halted a project involving a glucose-oriented smart contact lens.

Commercial availability for the Mojo Lens is likely about two years away, with the more immediate use cases in the enterprise space: areas such as retail, medicine, public safety and hospitality.

Seeing in the dark

Eventually, though, the hope is that any consumer will be able to wear versions, even those of you who don't necessarily need to correct poor eyesight.

The lenses also promise to help anyone struggling with low-vision impairments, and during one of my demos, I was able to make out people and objects in a darkened room.

Now, I didn't actually wear the contacts; Mojo set up other elaborate ways for me to "look through" the lenses.

In one case, I wore a VR-type headset that gave me the experience of selecting menus and items on the screen, initially by keeping my head steady while my eye peered off into the periphery. I found it more challenging than learning a new computer mouse.

Suffice it to say, there's no way to tell at this point how comfortable they are, but these are standard scleral-type lenses that use rigid and gas-permeable materials and other polymers that in theory anyway should make them feel the same in your eye as similar non-smart lenses. A scleral lens is designed to vault over the cornea and rest on the "white" of the eye (the sclera). It is commonly prescribed for those with irregular corneas or dry eyes.

You'd be able to use normal saline eye drops. The contacts will be custom-fitted and prescribed by a regular optometrist or eye doctor.

But the Mojo Lens also contains a teeny 14K-ppi display, which Mojo Vision claims as the smallest, densest display ever designed for such a purpose.

Lest you freak out about placing electronics in your eye, the company says the whole system is safe and won't consume much power, with the tiny radio inside transmitting microwatts that are many orders of magnitude smaller than any of your mobile phones or other devices.

Mojo is working closely with the Food and Drug Administration, which

must give its final approval—the lenses are classified as medical devices. The FDA did grant Mojo Lens a "Breakthrough Device" designation, which is likely to fast-track the process through clinical trials and such.

And Mojo announced a partnership with the non-profit Vista Center for the Blind and Visually Impaired in Palo Alto.

Making computing invisible

The company is pushing the concept of "invisible computing," where you have the data you want when you want it but are not otherwise bombarded with or distracted by data you don't need.

The idea is you won't look weird to the outside world either.

Smart sensors will help the smart lens determine when not to bother you, such as when you're reading a book, focused on work, or driving, says Steve Sinclair a former Apple executive who is now Mojo's senior vice president for product and marketing. Such a sensor might be able detect when you're sitting in front of the wheel of a car, for example.

Besides eye gestures, the company says you'll be able to control the lens interface with voice commands. You may eventually hear audio, too, when appropriate, not directly from a speaker in the lens, but via a wireless Mojo accessory you might wear that's hidden inside a helmet, hat, visor or necklace.

The system uses a proprietary wireless system to pass data from the contact lens to the accessory. It uses Wi-Fi or Bluetooth to move data from the accessory to your smartphone and 5G or Wi-Fi to send data to the cloud.

How much will smart lenses cost?

For now, Mojo isn't saying how much these smart lenses will cost, but you'll almost certainly pay a premium above what you currently shell out annually for contacts.

Equally unclear is what, if anything, insurance companies will pay toward these premium lenses, or how Mojo will pass along the cost of replacing lost or broken lenses to the consumer? Some contact lens wearers know how all-too-often these may pop out of your eye.

The company figures the lenses should last a year or so before they need to be replaced and that battery life should last all-day.

Eventually, Mojo might produce different colored lenses to appeal to people who wear colored contacts for cosmetic purposes. It's also likely that beyond the different prescriptions each of us has, the "smart" capabilities of the Mojo lens will differ from what your neighbor's can do. There could even be a curated Apple-style app store someday—filled with just what you want to do, play games through your contacts.