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## Augmented Vision through a Contact Lens

With the Coronavirus ravaging the country it was impossible for CES 2021 to take place in Las Vegas. The move to a fully virtual format caused the event to shrink in size from 4,400 exhibitors in 2020 to just 1,943 exhibitors in 2021.

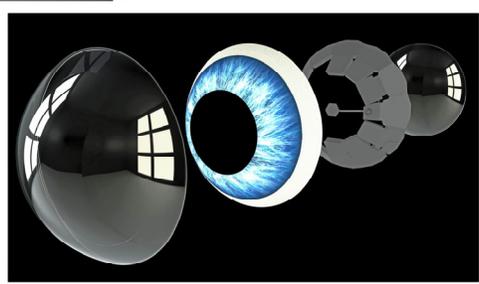
The WOW factor of what we can expect to be using in the near future still existed and I am proud to share with you the amazing features of the Mojo Vision lens; the award winner at this year's CES Last Gadget Standing live event. The presenters at this event actually created a very funny skit showing them trying out many of the new products that they were sent to try before picking the finalists. Watch online at: [https://youtu.be/\\_WGCio\\_yZAY](https://youtu.be/_WGCio_yZAY)

Augmented Reality (AR) is a technology that superimposes computer-generated images or information onto a user's view of the real world. Mojo Vision has actually micro-sized this technology so it fits into a contact lens. See photos 1 and 2. One advantage instantly gained by moving AR so it sits directly over the retina of the eye is automatic eye tracking for proper placement of images and information into images of the real world. Mojo Vision calls their technology invisible computing because it is impossible for an observer to see that a wearer is receiving augmented vision.



Photo Credit: Mojo Vision

To build AR into a contact lens the company created the "world's densest microdisplay" and built in the capability for it to project enhanced information directly onto a person's retina. Each lens is an individual streaming device that includes a



built in micro battery, micro processor, and micro motion sensors. This allows each contact to be aware of the images you are seeing so it can overlay images, enhance contrast and provide edge detection to the things that are in front of you. See photo 3. These types of visual enhancements would

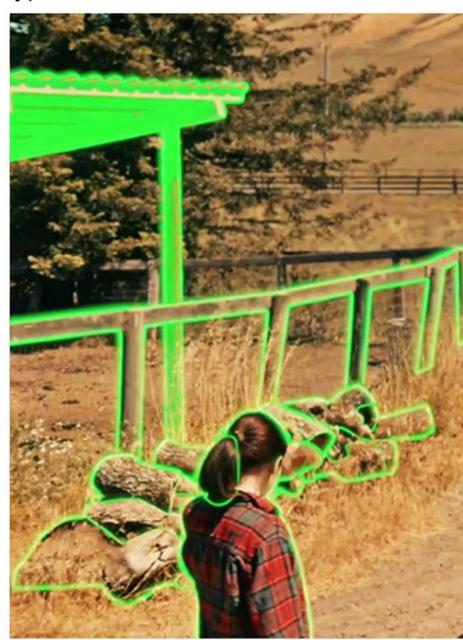


Photo Credit: Mojo Vision

be extremely helpful to a person who is visually impaired.

The computer power to make this work is mostly supplied by an accessory that the user would wear. This hardware is in constant communication with each lens and uses artificial intelligence to decide what each lens should project to its retina. The last element in the system is the person's personal smartphone which connects to the processing accessory by Bluetooth to further provide assistance with facial recognition, people's names, and information about objects that the eyes are seeing. ([www.youtu.be/TzVAMRe3kmA](http://www.youtu.be/TzVAMRe3kmA))

Since Mojo Visions' contact lenses provide all of this assistance invisibly they can help increase the wearers confidence. The Mojo Vision augmented reality sight system is considered to be a medical device and they are currently working with the FDA to get it approved. When they are approved these AR vision contact lenses will be sold through optometrists.

So far AR vision eyewear products have been geeky and have been mostly limited to sight impaired people and as a heads up display for surgical teams, scientists, engineers, students in special fields and workers in industrial settings.

The secret is out that Apple has been working on prototype AR and VR systems since 2015 and many experts feel that they will have products to sell this year. I expect that store shelves will soon be full of different AR vision eyewear systems that merge the real world with information from your smartphone meshed together. See Photo 4.



### Taking it a Step Further

1. Create a short video or PowerPoint that demonstrates the difference between Virtual Reality, Augmented Reality and Mixed Reality.
2. What do you see as the positive and negative side effects if the technology becomes popular?

*Alan Pierce, EdD, CSIT is a technology education consultant. Visit [www.technologytoday.us](http://www.technologytoday.us) for past columns and teaching resources*