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More than Meets the Eye

Hold on tight, because an NSF-funded contact lens and eyewear combo is about to plunge us all into the Metaverse.

Augmented reality (AR) has been steadily making inroads into society. Sure the gaming is fun, but when you consider fields like medical training and remote site access for safety inspectors and science teachers, AR offers a lot of promise.

However, many head mounted displays (HMD) are clunky and cumbersome and continue to restrict wide scale adoption of AR. What's more, continual access to the digital world while navigating the real world presents a safety challenge.

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Close encounter. A smart investment by the NSF, eMacula puts augmented reality in a contact lens.

So what's the remedy that will vault us in to the Metaverse?

“Contact lenses appear to be an optimal solution, but only if the user experience can deliver on the promise in comfort, real functionality, and a price point that consumers can afford,” says Chris Collins, founder and technical lead for the Center for Simulations and Virtual Environments Research (UCSIM) at the University of Cincinnati.

“A product that meets all of those challenges could be a game-changer and bring us that much closer to a seamless immersive experience.”

Virtual Freedom

Finally, scientists have come up with a way to free users from HMD and bring the virtual world closer than ever before.

To better integrate the two worlds, Seattle-based startup Innovega has developed eMacula.

“Allowing a user to have their digital media within their normal and unobstructed field of view means that people will stop staring at their phones and devices and start looking at each other again,” says Jay Marsh, vice president of engineering at Innovega.

“It means that bio-metric health monitoring can be truly 'real time, all the time' and with driving/navigation directions painted on the road in front of you, you will never be distracted with a gaze shift to your mobile devices for guidance.”

Funded in part by Small Business Innovation Research grants from the US National Science Foundation, Innovega has developed a filtered lens in a hybrid style contact lens along with lightweight and stylish eyewear.

Pairing the glasses with a contact lens significantly reduces the burdens previously associated with HMD.

“NSF was a critical player in the development of our current soft lens technology,” says Marsh.

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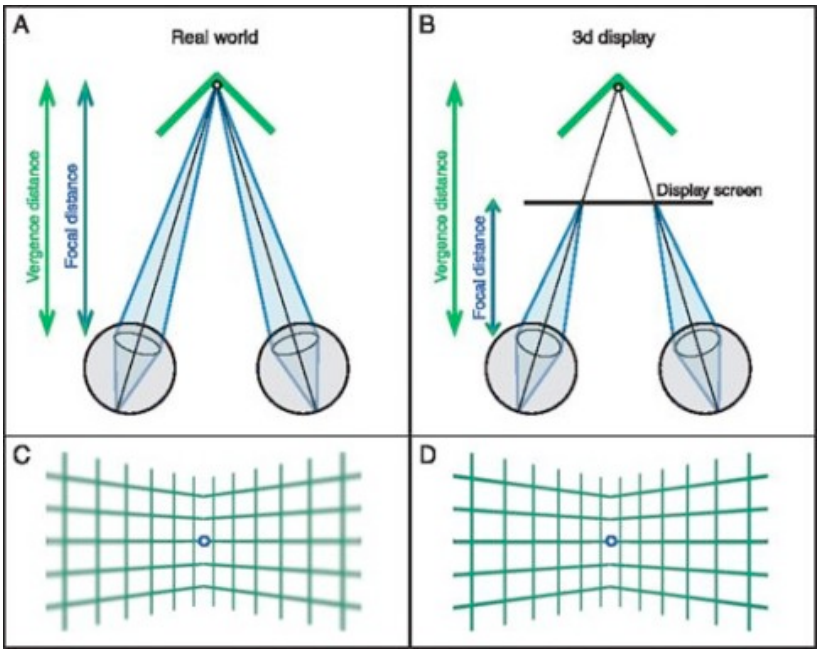
Troubled Technology



With traditional AR, a problem known as vergence-accommodation conflict arises since our eyes try to focus on the screen in front of them, but end up converging at a farther distance. Often eyestrain, headaches, and nausea result.

The contact lenses circumvent this problem because the media on the lenses is in focus while the eyes converge on the glasses behind.

Merging the real and virtual worlds has broad implications for many professions, Marsh says. Doctors and technicians that need both hands to execute their work while also needing access to critical information will find great use in merging the virtual and real worlds.

In an industry setting, Marsh foresees applications that allow for system level safety data to be provided to all operators in real time, and more refined information based on physical locations.

The lenses are currently undergoing FDA approval and should be on the market later in 2017.

It appears the next step in the digital mobile evolution of technology may be on the horizon, and the natural integration of the virtual world into our real experience is at hand.

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Bellevue startup Innovega looks to enable virtual-reality viewing using screen-equipped glasses plus contact lenses. Innovega may have found a way to get rid of bulky virtual-reality headsets, using a pair of regular-size glasses and contact lenses.

Virtual reality may be a hot new trend, but those dorky headsets certainly are not. What if experiencing virtual reality was as simple as putting on a pair of contacts?

Bellevue startup Innovega may have found a way to get rid of bulky virtual-reality headsets, using a pair of regular-size glasses and contact lenses — a product that it calls eMacula.

Currently, virtual-reality (VR) headsets use screens similar to smartphone screens, Innovega CEO Steve Willey explained. The screen must be set a few inches from the eyes to allow people to perceive it correctly. The familiar big VR headsets allow the screen to sit the correct distance from your face.

Innovega set out to find a way to make virtual and augmented reality more accessible and mobile.

“Our company recognizes what we had to do to catalyze this industry was we had to solve the optics problems,” Willey said.

Innovega is accomplishing that by fixing a screen to the inside of a traditional pair of glasses. Then it adds contact lenses to the equation. The contacts, which are outfitted with dual focal planes similar to bifocals, let wearers focus on the screen without its having to be set inches away from their eyes.

The contacts also correct vision, so they could be outfitted with a wearer’s prescription and be worn daily, just like regular contact lenses.

Innovega, which got its start in 2008, has been doing clinical trials on the lenses for a year. It’s currently working to obtain Food and Drug Administration approval for its contacts.

The company has raised about $3 million from investors, including Tencent, the owner of popular Chinese messaging app WeChat. Innovega has also raised about $6 million from government grants, including from the National Science Foundation.

The company has 10 employees and plans to partner with VR companies to bring actual media to its eMacula glasses/contact lenses.

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