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UNC, Nvidia Serve Up the AR Goggles of the Future

BY DAMON POETER AUGUST 5, 2014 02:45PM EST 0 COMMENTS

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Researchers from the University of North Carolina and Nvidia are billing their new augmented reality (AR) technology for heads-up displays as Iron Man come to life.

That's Hollywood's version of Iron Man—in films starring Old Shellhead, Tony Stark's helmet provides him with information-rich visual overlays of the world around him, as well as up-to-the-second suit diagnostics, recommended courses of action, access to the Internet and other communications networks, and more.

Unfortunately, today's AR is still a far cry from what we get in the movies, with designs that are "still fairly bulky or have a narrow field of view," Nvidia spokesman Ken Brown said. Think big, clunky headgear like the [Oculus Rift](#) versus smaller devices like [Google Glass](#)—the first offers a great field of view but in an unwieldy package, while the second is much more wearable but with an extremely scaled-down viewing area.

Enter the Pinlight Display, developed by a research team including Andrew Maimone, Kishore Rathinavel, Kurtis Keller, and Henry Fuchs of the University of North Carolina at Chapel Hill, along with David Luebke of Nvidia Research and Douglas Lanman, formerly an Nvidia researcher who now works at Oculus VR.

The team will [present a paper describing the technology](#) at Siggraph 2014 in Vancouver later this month. The upshot is that the researchers say they've figured out a way to produce the wide field of view provided by headwear like the Oculus Rift but in a compact design that scales down to the size of a pair of eyeglass, like Google's device.

"Instead of conventional optics, the design uses only two simple hardware components: an LCD panel and an array of point-light sources (implemented as an edge-lit, etched acrylic sheet) placed directly in front of the eye, out of focus," the team explained in an abstract for its paper, "Pinlight Displays: Wide-Field-of-View Augmented-Reality Eyeglasses Using Defocused Point-Light Sources."

Simplicity is key here—the researchers said that by leaving out conventional optics components like lenses and beam splitters, they were able to achieve a very wide field of view without being forced to create a bulky device.

The team also explained how the contraption works:

"The point-light sources are coded through the LCD to form miniature see-through projectors. A virtual aperture encoded on the LCD allows the projectors to be tiled, creating an arbitrarily wide field of view. Software rearranges the target augmented image into tiled sub-images and sends them to the display, where they appear as the correct image when observed out of the viewer's accommodation range," the abstract said.

Pinlight Display technology is now in the prototype stage; its effectiveness has been tested via eye tracking and it's been demonstrated to provide "a preliminary human-viewable display," the researchers said.

The prototype designs support a field of view of 100 degrees or more, according to Brown, who said such a wide field of view is "crucial to enable spatially-correct augmented reality applications."

Nvidia and the UNC researchers said there were "unlimited applications for such a capability—from navigation to gaming to aircraft repair," but so far, there's no word on when these promising AR goggles will be available to consumers.