Passing the Visual Turing Test in AR/VR

Doug Lanman
Senior Director, Display Systems Research, Reality Labs Research, Meta
Affiliate Instructor, University of Washington, CSE

IRB 4105
Online: https://umd.zoom.us/j/3289959085

Tuesday, May 2nd
3:30pm EST

How can a display appear indistinguishable from reality? We describe how to pass this "visual Turing test" using AR/VR headsets, emphasizing the perceptually driven joint design of optics, display components, rendering algorithms, and sensing elements. Topics covered include compact holographic optical elements for ultra-compact VR headsets, high-resolution viewing optics, accommodation-supporting VR headsets, distortion correction, wide fields of view, high dynamic range, occlusion-capable AR displays, and mixed reality passthrough systems.

For more details, see this recent blog post from Meta and a related interview with Tested.com:

- https://tech.facebook.com/reality-labs/2022/6/passing-the-visual-turing-test-the-inside-story-of-our-quest-for-visual-realism-in-vr/
- https://www.youtube.com/watch?v=x6AOwDttBsc

Short Biography: Douglas is the Senior Director of Display Systems Research at Reality Labs Research, Meta, where he leads investigations into advanced display and imaging technologies. He is also an Affiliate Instructor at the University of Washington CSE Department, where he is currently teaching a course on building VR headsets from scratch. His prior research has focused on head-mounted displays, glasses-free 3D displays, light field cameras, and active illumination for 3D reconstruction and interaction. He received a B.S. in Applied Physics with Honors from Caltech in 2002 and M.S. and Ph.D. degrees in Electrical Engineering from Brown University in 2006 and 2010, respectively. He was a Senior Research Scientist at Nvidia Research from 2012 to 2014, a Postdoctoral Associate at the MIT Media Lab from 2010 to 2012, and an Assistant Research Staff Member at MIT Lincoln Laboratory from 2002 to 2005.