Perceiving depth in Virtual Environments

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Virtual environments are useful for applications ranging from video games, physical and psychological rehabilitation programs, training simulations, and 3D movies. One especially compelling and immersive feature of many virtual reality systems is the ability to present scenes in stereoscopic 3D ("stereo"), which provides additional depth information. Despite advances in display technology, depth in virtual environments is commonly under-perceived by up to 50%. People perceive virtual items as closer than they are meant to be. Improper display of stereo depth cues might be one cause of under-perception. Depth perception is usually accurate in the real world, and so depth perception in virtual environments must improve in order for those environments to accurately simulate real world environments. The goal of this project is to better understand the cues that contribute to depth perception in virtual environments, and to develop strategies for improving depth perception. This project will involve creating virtual environments to test specific theories, and testing users to evaluate depth perception in those environments.