Applicability of Commercial Virtual Reality to Maintenance Training

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ABSTRACT

The last two years have been very important for commercially available Virtual Reality (VR). The Oculus Rift, The HTC/Valve Vive, the Sony PlayStation VR, and various Windows Mixed Reality headsets have all been released. All have similar video rendering capabilities and work with a hand tracking controller. In addition, for the PC there are sensor solutions such as the Leap Motion and the Perception Neuron for hand and body tracking. While gaming applications are the primary focus of these devices, there are also significant potential impacts to training. However, poor implementations of VR can lead to negative training, and worst case, discomfort and nausea. This paper examines the work Boeing has done to apply commercial VR solutions and best practices to aircraft maintenance training. Providing such a solution will offer the student the ability to train in an immersive environment without large space or specialized hardware requirements. In particular, we look at ways to comfortably move through a large VR environment and interact with objects such as tools and aircraft parts to provide positive training experiences. This paper will illustrate iterations performed, indicating what worked well and what didn't. This solution differs from just applying commercial practices, because training is constrained to work with real materials of defined size and shape. We cannot simply alter the environment to achieve a better VR implementation as game designers can do. Our approach shows that even with these constraints, we can provide a viable training solution that augments current maintenance training practices using COTS VR products in a small floor space footprint and minimal set uprequirements.

BIO

Eric Spalding grew up in Louisville, KY and obtained a Computer Science degree from the University of Louisville. He started at McDonnell Douglas (now Boeing) in St. Louis in 1990, writing software for defense Mission Planning application. Over the next 20 years, he worked a variety of positions in Mission Planning, and in 2006 was awarded the title of Associate Technical Fellow. In 2012, he switched roles to be a IRAD (Internal Research and Development) lead for Training Systems and Government Services. That role has evolved, and he is now a technical lead for the Training and Professional Services Innovation team, leading efforts to define and implement next generation training capabilities.