



McGill, M. and Brewster, S. A. (2017) I Am The Passenger: Challenges in Supporting AR/VR HMDs In-Motion. In: 9th International Conference on Automotive User Interfaces and Interactive Vehicular Applications Adjunct: AutomotiveUI '17 Adjunct, Oldenburg, Germany, 24-27 Sept 2017, p. 251. ISBN 9781450351515 (doi:[10.1145/3131726.3131876](https://doi.org/10.1145/3131726.3131876))

This is the author's final accepted version.

There may be differences between this version and the published version. You are advised to consult the publisher's version if you wish to cite from it.

<http://eprints.gla.ac.uk/155124/>

Deposited on: 11 January 2018

Enlighten – Research publications by members of the University of Glasgow
<http://eprints.gla.ac.uk>

I Am The Passenger: Challenges in Supporting AR/VR HMDs In-Motion

Mark McGill

mmcgill@gmail.com

Glasgow Interactive Systems Section,
University of Glasgow, UK

Abstract

This video provides an overview of our research into the use of Head Mounted Displays (HMDs) in-car and in-motion. These immersive HMDs offer new possibilities for entertainment and productivity during travel. However, their use is confounded by motion sickness, caused in-part by the conflict between visually and physically perceived motion. Moreover, consumer HMDs cannot currently distinguish between the head motion of the wearer and rotations of the car. These problems represent significant impediments to their use in-motion, which our research aims to overcome.

Stephen A. Brewster

Stephen.Brewster@glasgow.ac.uk

Author Keywords

Autonomous Car; Virtual Reality; Motion Sickness;

CCS Concepts

- Human-centered computing~Empirical studies of HCI

Introduction

Augmented and Virtual Reality HMDs offer a number of advantages over existing in-vehicle displays. They allow content to be rendered at any size/position/angle, with depth and privacy. Moreover, the greater the capability of the HMD to occlude reality, the more they can potentially immerse the wearer in a virtual world, escaping the confines of the vehicle. However, their use is confounded by motion sickness, caused in-part by the restricted visual perception of motion conflicting with physically perceived vehicle motion. In addition, existing HMD sensing cannot distinguish between the head motion of the wearer and the rotations of the vehicle. This video summarizes our initial research [1] into these problems, examining how to stabilize viewing relative to car movements and how we might visually convey motion alongside existing HMD content.

1. Mark McGill, Alexander Ng, and Stephen Brewster. 2017. I Am The Passenger: How Visual Motion Cues Can Influence Sickness For In-Car VR. In *Proc. CHI '17*. <https://doi.org/10.1145/3025453.3026046>