

# Using Peripheral Visual Motion Cues in VR can Mitigate Motion Sickness without Distracting from Reading

Katharina Pöhlmann, Marc Auf der Hyde, Gang Li, Frans Verstraten, Stephen Brewster, Mark McGill

## Can Visual Motion Presented in a VR Headset Reduce Motion Sickness for Vehicle Passengers?

### Introduction

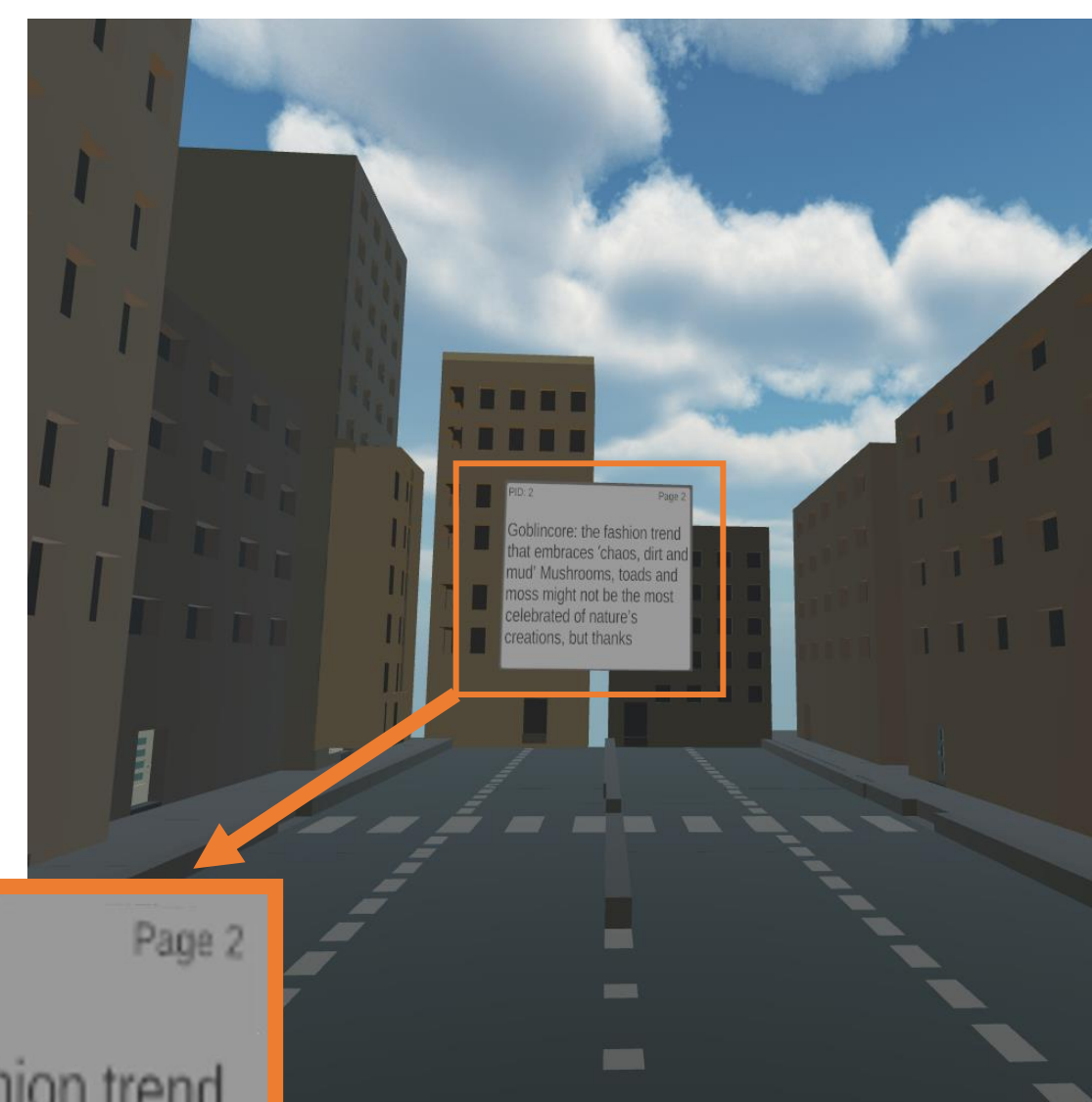
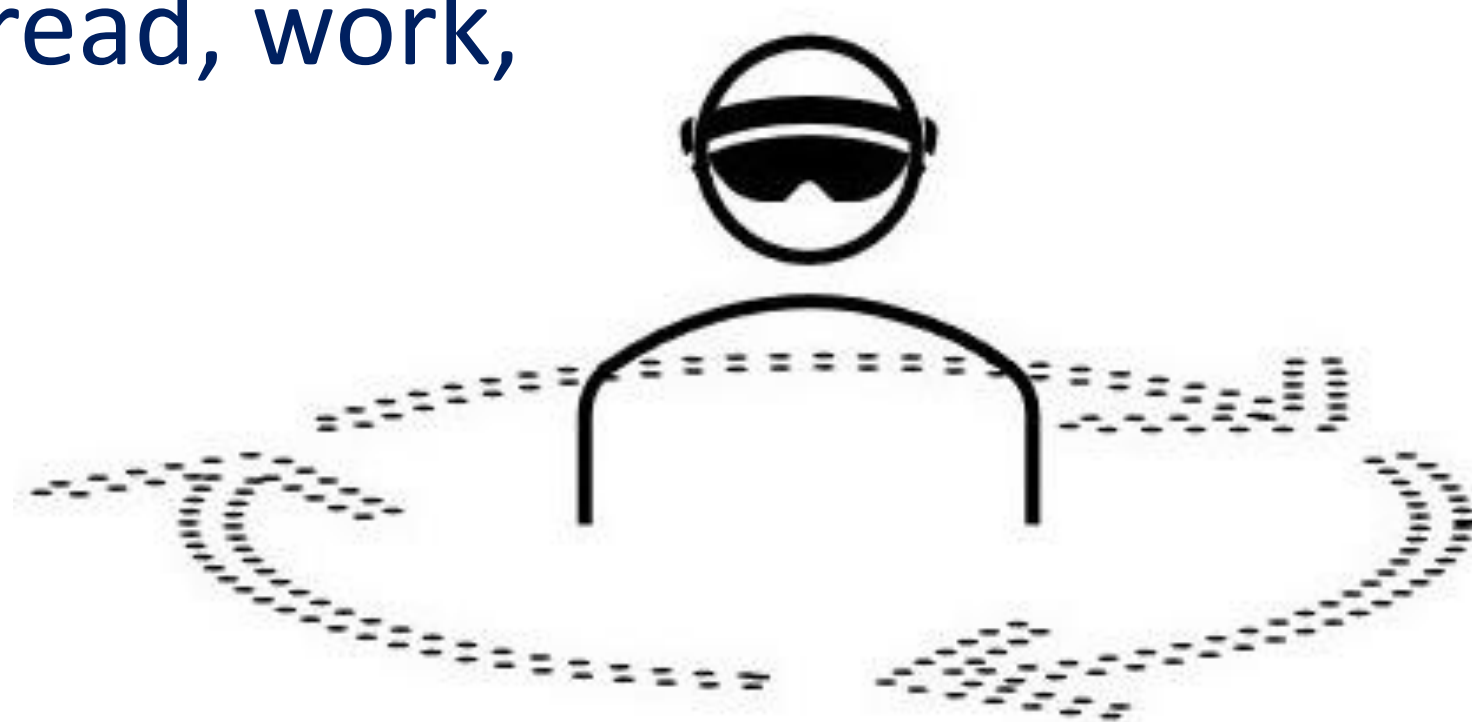
- Automated Vehicles will result in more **Motion Sickness** due to:
  - More passengers rather than drivers
  - Non-driving related tasks
  - Changes in car interior (occlusion of outside world)

→ **Conflict between Sensory Systems**

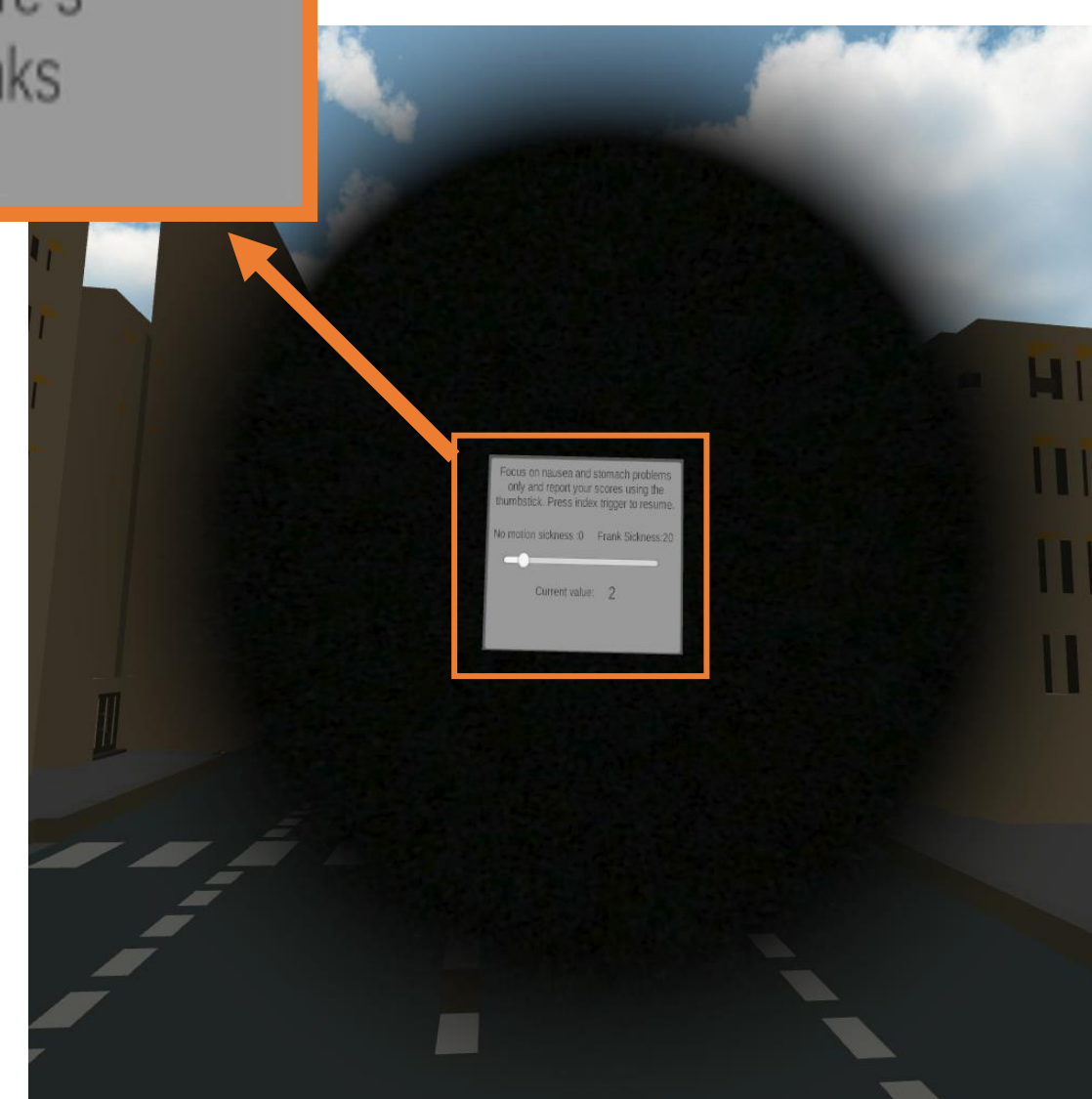
We propose **VR headsets** to **mitigate Motion Sickness** while users can perform **non-driving related tasks** (read, work, watch movies)

### Study Design

- Participants were seated on the **RotoVR chair** wearing a **Vive Focus 3**
- Yaw rotations (speed, degree) were based on an **urban city drive** (see map)
- 4 Conditions:**
  - Baseline No-Motion:** No chair rotation
  - Full FOV:** Visual Motion is presented in the entire FOV behind a reading task
  - Partial FOV:** Visual Motion is presented in periphery only
  - Baseline Motion:** No Visual Motion is presented

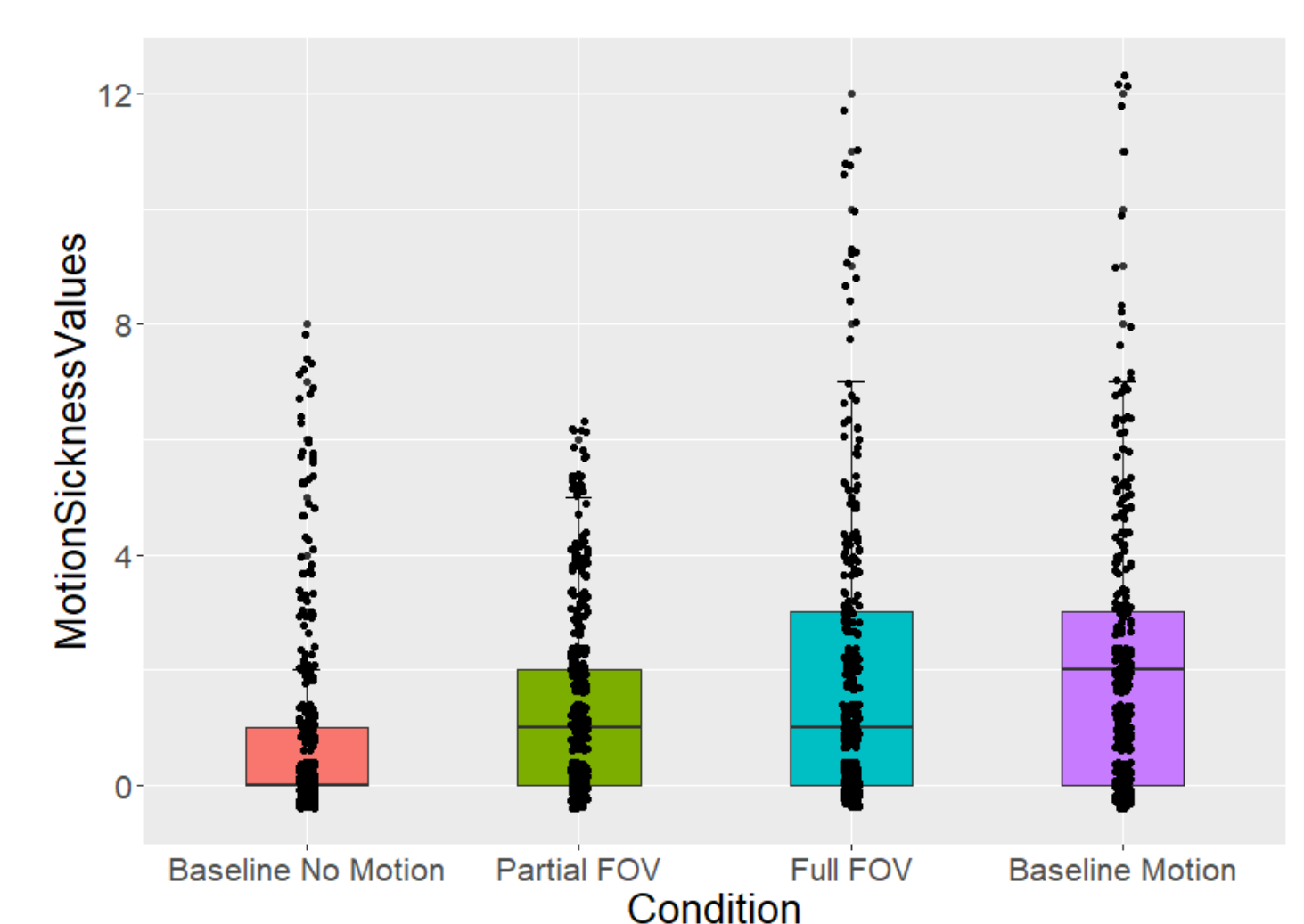


PID: 2 Page 2  
Goblincore: the fashion trend that embraces 'chaos, dirt and mud' Mushrooms, toads and moss might not be the most celebrated of nature's creations, but thanks



### Results

- Baseline Motion** condition caused more **Motion Sickness** compared to the **Baseline No-Motion** condition (FMS and SSQ)



- Conditions did not differ in their perceived **Mental Demand**
- Full FOV** condition was perceived as more **distracting** compared to the **Baseline No-Motion** condition
- Reading Speed** increased with increasing Motion Sickness. Participants also read faster in the **Baseline Motion** condition compared to the **Baseline No-Motion** condition

