Conference Poster

Visualizing Transport Futures
The potential of integrating procedural 3d modelling and traffic micro-simulation in Virtual Reality applications

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Visualizing Transport Futures
The Potential of Integrating Procedural 3D Modelling and Traffic Micro-simulation in Virtual Reality Applications

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FUTURE CASE STUDIES

VR IN TRANSPORT PLANNING

So far, visualizations to communicate future street designs rely heavily on pictures, photo-montages, maps or simulations. Recent and ongoing technological developments in the field of Virtual Reality (VR) open new ways for architects and planning agents to inform the public about new developments and facilitate stakeholder involvement. What are the potential uses of Virtual Reality in transportation research and planning?

BEHAVIOURAL EXPERIMENTS

Walking and cycling is a multi-sensory experience which includes vision, auditory, somatic sensation, olfactory and vestibular sensory stimulation. Conducting surveys to understand the perception of variations in street design and cycling conditions is a vital aspect of transportation research, especially in areas where cycling is a viable mode of transport. However, traditional methods of conducting surveys are often limited and do not provide a true representation of real experiences. As immersive virtual environments become more accessible technology, the potential applications and reactions to changes in infrastructure could help us understand the dynamics and design preferences for urban cycling. We also see much potential for the use of VR in revealing aspects of urban traffic design, such as the influence of design on the behaviour of other road users and the pedestrian environment.

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STATED PREFERENCE SURVEY

Formal surveys to study driver behaviour and traffic micro-simulation are widely used to assess the impact of traffic planning and design changes. However, a common weakness of these approaches is that they are based on past experiences and cannot fully capture the full range of experiences that drivers may have. In this paper, we present a novel approach to combining survey data with traffic micro-simulation to study the impact of design changes on traffic flow and pedestrian safety.

The exhibit was used to conduct an experiment to understand the added value of VR as a communication and outreach tool. To study the impact of traffic design changes, we conducted a qualitative, exploratory pilot study to better understand the added value of VR, as we proposed with the Bike to the Future setup.

As it is today New design

Yes

No

We generated 200 choice scenarios with the following two settings: one with the presence of a cycle lane and one without. Depending on the setting, we asked people whether they would feel safer or less safe cycling in the new design.

Bicycle Simulator

An integration of PTV Visum and Unity through a VR cycle simulator provides a unique setup for implementing a VR cycling simulator. Multiple cycling lanes with different design configurations can be simulated and evaluated in a more controlled environment. We also see much potential for the use of VR in revealing aspects of urban traffic design, such as the influence of design on the behaviour of other road users and the pedestrian environment.

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