Virtual Reality 2020: Applications in Driver Education

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Augmented Reality (AR)
Potential Challenges with VR

► Discomfort/illness
Potential Challenges with VR

- Discomfort/illness
- Equipment needed
Potential Challenges with VR

- Discomfort/illness
- Equipment needed
- Costs
**Advanced Virtual Reality Headset Based Training to Improve Latent Hazard Anticipation Ability**

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**V-RAPT**

A virtual reality-based training program developed in Unity 3D headset (Oculus Rift).

**Apparatus**

- **Training:** Oculus Rift provides 360 degree perspective views of the training scenarios within more immersive environment (120° at any time)
- **Posttest:** Realtime Technologies Inc., fixed-base, full-cab, Driving Simulator with 150 degrees of horizontal view;
- **Applied Science Laboratory Mobile Eye XG head mounted Eye Tracker**

**Results**

Fig 1. VR (left) Scenarios; Driving Simulator Scenarios (right)

![VR Scenarios](image1)

![Driving Simulator Scenarios](image2)
Scenario 1 Near

- Please click on the area of the scene where you believe a hazard which is now not visible could potentially appear.
Proportion of Potential Hazards Detected

Proportion

Placebo  RAPT  RAPT-VR

Proportions:
- Placebo: 0%
- RAPT: 50%
- RAPT-VR: 100%

(Chart showing the comparison of potential hazards detected between Placebo, RAPT, and RAPT-VR treatments)
Effect on Drivers’ Average Speed

Proportion

Placebo                              RAPT                             RAPT-VR
- Engagement
- Feedback
- Not “work”
- Effective!
Scenario 3 Near

Please click on the area of the scene where you believe a hazard which is now not visible could potentially appear.
• You missed “looking” at the location from which a potential hazard could appear.

• This is an example of the situation where a potential hazard is obstructed by the truck on the right.

• *Note that the correct response is now indicated on the right.*

• Any approaching pedestrian or bicyclist may be hidden by the truck.

• Let’s try one more time! (Please click on the ‘NEXT’ button)
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Scenario 3: ACCEL Module 2, Scenario 1 - Far

The figure on the right lists 5 possible ways you can control the lane position of your vehicle using the steering wheel.

Please choose one action you would take to control the lane position of your vehicle in this scenario by selecting the associated arrow, then confirm it by selecting "Confirm".

Choosing the bottom arrow indicates that you would like to maintain your current position in the lane.

Choosing the top arrow to the left of the middle arrow indicates you want to steer left within your lane; choosing the arrow farthest to the left indicates you want to steer left out of your lane.

Choosing the top arrow to the right of the middle arrow indicates you want to steer right within your lane; choosing the arrow farthest to the right indicates you want to steer right out of your lane.