


9-6-2012

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Recommended Citation

Moran, Brian P., "Steering Adaptation in a Driving Simulator" (2012). *Undergraduate Research Posters 2012*. 28.
https://engagedscholarship.csuohio.edu/u_poster_2012/28

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Steering Adaptation in a Driving Simulator

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Abstract

Steering adaptation in a driving simulator occurs when participants, who possess the skills necessary to control a vehicle, modify their use of the steering controls to successfully interact with a driving simulator. Addressing adaptation in driving simulation experiments is important because of the need to produce quality data, in an economical fashion, while maintaining ethical practices. Adaptation is generally addressed by having participants drive a practice scenario of a fixed length or fixed time, or by having them drive until they feel comfortable controlling the vehicle. To ensure adaptation has occurred, quantitative methods have been proposed to analyze measures of accuracy and efficiency.

This study was focused on examining the improvement in the accuracy of a steering task while the efficiency of the task remained constant. Twenty five participants were asked to perform a target acquisition task while maintaining a constant travel speed of 25 miles per hour. As expected, the accuracy of the steering task improved over time and could be used to infer whether participants had adapted. This approach is sensitive to individual driving styles, as it is free of any threshold, criterion, or benchmark value and can be applied to any steering task at any driving speed.