

Research Report Summary



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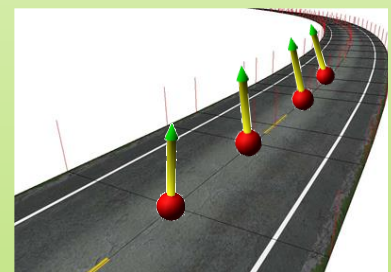
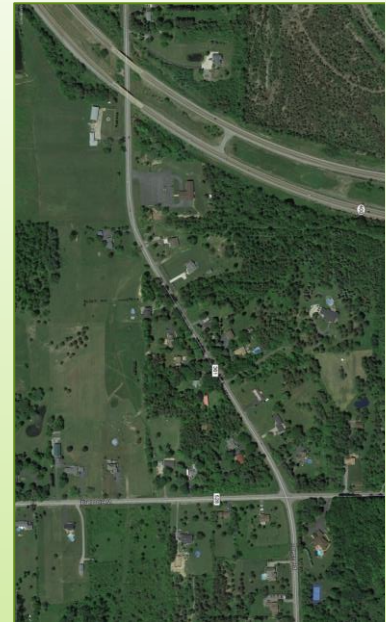
Using Naturalistic Data to Develop Simulator Scenarios



Naturalistic data collection and driving simulation are useful tools for studying transportation safety and human performance. Each approach has its own unique benefits and potential drawbacks. The goal of this project was to help merge these research tools by developing driving simulator tiles from naturalistic data in the Strategic

Highway Research Program 2 (SHRP2). Tiles were developed from two rural curves that contained a large number of trips from the SHRP2 data collection. We replicated features in the tiles, such as trees, lights, and roadway markings, that we expected to impact driver performance.

SHRP2 Rural Curves



Map, tile development, and simulator views of the rural curves



The tile creation process was adapted from a previous collaborative SAFER-SIM project between the Universities of Iowa and Wisconsin. Using the naturalistic tiles, data were collected from both the high-fidelity NADS-1 driving simulator at the University of Iowa and the medium-fidelity RTI simulator at the University of Wisconsin-Madison.

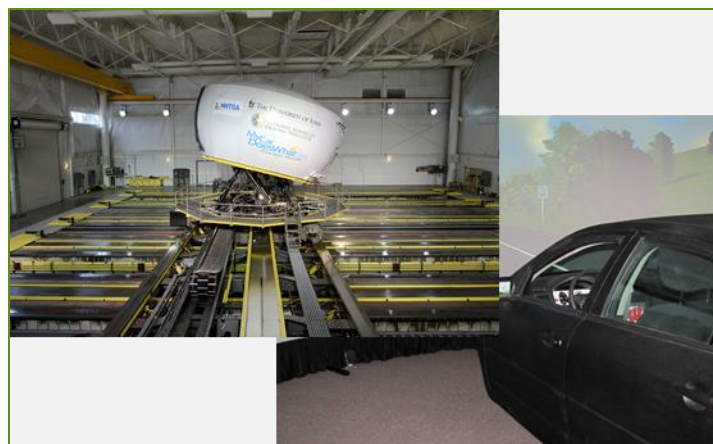


One advantage to recreating real-world locations in the driving simulator is a high degree of experimental control. To illustrate the research possibilities, we manipulated factors such as driver age and distraction (engaging with

a text-entry task while driving in curves). The tiles were placed in the context of a larger driving experiment, allowing us to leverage data collection resources.

Another advantage of this approach is that data can be collected quickly, from a diverse sample of drivers. The NADS-1 data collection, for instance, included sixty-one drivers drawn from younger (21-45) and older (60-79) age groups. The data extracted from the simulator are expansive and collected with higher precision (up to 240Hz) than typical naturalistic data. As this project demonstrates, the simulator tiles can also be used across different simulator platforms with varying levels of fidelity.

This collaborative SAFER-SIM research project demonstrates the feasibility and potential benefits of this approach to developing simulator scenarios from real-world locations used in naturalistic data collection.



“By developing simulator scenarios based on real-world locations, we hope to merge the experimental power of simulators with the external validity of naturalistic data collection.”