



**ARTICLE #3**

# **SIMULATORS FOR RESEARCHING DISTRACTED DRIVING**

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**FOUR WAYS DRIVING SIMULATORS HAVE  
INFORMED THE RESEARCH INDUSTRY  
ARTICLE SERIES**

## SIMULATORS FOR RESEARCHING DISTRACTED DRIVING



**RDS-2000 IMMERSIVE SIMULATOR FOR DRIVER DISTRACTION**

### DANGERS AND IDIOSYNCRASIES OF DISTRACTED DRIVING

Everyone agrees that distracted driving is a substantial problem—but how substantial? Many agencies estimate it accounts for 10% to 15% of all traffic accidents. But it could be much larger. According to a 2020 Chinese study, 74% of the survivors of traffic accidents cited distracted driving as the primary cause of their crash. This study interviewed 9,982 crash survivors between the ages of 18 and 34. The majority of these drivers (82%) cited phones specifically as a distraction. Other research has found that an average driver misses 40% of all traffic signs within one minute of taking a call (even when using hands-free technology).

But researchers are also beginning to discover how little we understand distracted driving. For example, at least one study has found a situation where distracted drivers perform better than expected. This was a 2019 study of 60 drivers, focused on emergency takeover while operating a “self-driving” car. Unexpectedly, researchers found that the participants they distracted with secondary in-vehicle task were able to respond to the “emergency” and take control of the vehicle more quickly than their undistracted peers.

### USING RTI IMMERSIVE SIMULATORS TO CONFRONT DISTRACTED DRIVING

Today’s researchers and engineers are looking to delve deeper into the inner workings of the distracted mind. For example, for a study recently published in Nature, researchers at Stanford tracked the brain activity of distracted drivers while they were behind the wheel. This team was able to “highlight a significant increase” in specific brain activity “in response to increasingly greater levels of smartphone distraction.” These, in turn, reliably mapped to notable deviations in vehicle control. The hope is to eventually craft safety features that alert a motorist to the fact that they are losing focus—before they are even aware this is the case.

In order to accomplish this, Stanford deployed a standard Realtime Technologies (RTI) immersive simulator which they then networked with an off-the-shelf



**SIMDRIVER CAN OFFER DATA THAT SHOWS WHY DRIVERS BECOME DISTRACTED**



**DISTRACTIONS FROM DRIVING COME IN MANY FORMS, INCLUDING ADDITIONAL PASSENGERS IN THE VEHICLE**

## FEATURES

smartphone and third-party neural monitoring peripherals—including eye-tracking and functional near-infrared spectroscopy (fNIRS) hardware. Stanford chose an RTI system specifically because the open architecture allowed them to create a custom system that would “automatically synchronize EEG, EKG, respiration, and skin conductance with driving behavior, allowing new answers to questions about distraction and the ability of cars to take over based on the driver’s mental and physical state.”

- Integrate third party devices and peripherals or create your own custom plug-ins to transfer data via TCP, UDP, local wireless, Bluetooth, etc.
- Natively track and synchronize driver behavior data via the optional SimObserver add-on
- Design, develop, and debug complete driving scenarios—without writing a line of code or sacrificing open access to the underlying program
- The driver distraction research platform favored by Stanford, MIT, University of Texas, and Ohio State University (in cooperation with Honda)

# RESEARCH SIMULATION SIMPLIFIED



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