NADS-1 miniSim™ Instrumented Vehicle NADS-2

The National Advanced Driving Simulator

The University of Iowa

TheDriverSeat

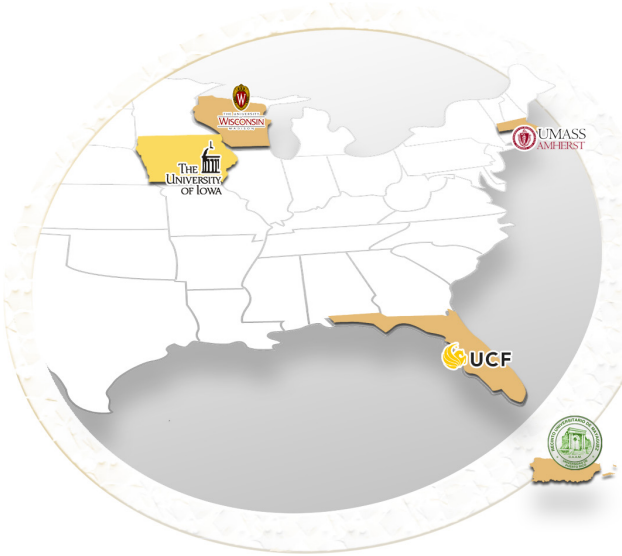
NADS - The National Advanced Driving Simulator - February 2014

NADS launches SAFER-SIM University Transportation Center

SAFETY RESEARCH USING SIMULATION

NADS has been selected to receive a University Transportation Center grant from the U.S. Department of Transportation (DOT) Research and Innovative Technology Administration.

The center, titled Safety Research Using Simulation (SAFER-SIM), will utilize driving simulation to address the safety issues prioritized by the U.S. DOT. The center will conduct research, sponsor outreach activities in Science, Technology, Engineering and Mathematics (STEM) areas, and aid workforce development efforts in the area of transportation safety. The research will address all road users including passenger car drivers, transit users, pedestrians, bicyclists, and heavy truck drivers. NADS research director, Susan Chrysler, will serve as the center director.



In addition to the UI, consortium members are the University of Central Florida, University of Wisconsin-Madison, University of Massachusetts-Amherst, and University of Puerto Rico-Mayaguez.

Each of the consortium members has interactive driving simulators used by faculty, students, and staff from civil engineering, industrial and systems engineering, public health, psychology, and computer science. The grant will foster interdisciplinary collaborative research, education, and workforce development activities.

SAFER-SIM joins 35 other UTCs funded through the competition which fielded over 140 proposals.

The homepage for SAFER-SIM is located at:
http://safersim.nads-sc.uiowa.edu

Herm Reininga
Interim Director

Sue Chrysler
Director of Research

Omar Ahmad
Director of Operations

The National Advanced Driving Simulator
The University of Iowa
2401 Oakdale Blvd
Iowa City, IA 52242
Phone: (319) 335-4673
Fax: (319) 335-4658

contacts@nads-sc.uiowa.edu

miniSim™ Multi-Site Study

NADS will be coordinating a study, funded by NHTSA, that includes a novel approach to collecting driving simulator data. The project, *Vehicle-to-Vehicle Safety Applications*, will examine auditory characteristics of crash warnings enabled by Connected Vehicles systems. The study leverages the unique miniSim research network to collect data at five locations around the US.

The combination of these sites provides geographic variety that includes bi-coastal, southern, and mid-west regions of the United States, a range of population densities and socioeconomic factors from which to draw an overall representative sample of U.S. drivers. The simulator drives and experimental protocol will be developed and tested at NADS, then implemented on MiniSims at the various data collection sites. Single site development and the use of a MiniSim at each location provides consistency in the method and apparatus used, something not often encountered in driving research.

Data collected from 500 participants (100 participants at each site) will be combined into a single data set for analysis. This project brings together researchers from multiple institutions to collaborate on collecting a national representative sample of participant drivers: University of Iowa, University of Washington, Clemson University and Texas Transportation Institute with Leidos in Virginia participating as a data collection site under a separate contract. The study will begin in 2014 and the final report will be submitted to NHTSA in early 2015.

Image Generator Upgrades

NADS is in the process of upgrading our image generator and projectors that will enable more realistic and complex night and day time driving environments. Higher resolution will enhance the ability to discern signs and objects in the driving environment. LED dimming technology will enable even more realistic night-time driving environments. Better contrast and rich, saturated colors will enhance the realism of all driving environments and will significantly improve the ability to see traffic signals. All of this will be accomplished via a custom-built image generator driving 16 LED projectors in the NADS-1 dome. Drivers will now be able to experience real-time rain/snow effects with dynamic lighting from multiple light sources.

The extra horsepower will enable drivers to experience our newest driving environment, called Springfield, which features several miles of roadway though very realistic urban, residential, rural and interstate areas. In summary, we will continue to define the state of the art in driving simulation and bring greater value to our sponsors and customers.

Dr. Gaffney Key Presenter at TRB Workshop on Mobility

Mobility is a key factor in quality of life, and how to make transportation system accessible to all users including those with cognitive impairment and anxiety disorders. There has been an increased focus on aiding individuals who are diagnosed on the Autism Spectrum or with conditions such as anxiety disorders, post-traumatic stress disorder (PTSD) as these diagnoses increase. New research has focused on how to aid these individuals in accessing the transportation system.

Dr. Gary Gaffney, a faculty affiliate from the Department of Psychiatry, presented on these conditions and the challenges faced by individuals, as they try to access critical services of the transportation system. Particular focus was provided on PTSD and the challenges faced by veterans of the wars in Iraq and Afghanistan, and on individuals on the Autism Spectrum due to their continued prevalence. Individuals with PTSD often face challenges in acclimating to civilian driving and struggle with flashbacks from roadside bombs they experienced in the field. Individuals on the Autism Spectrum often struggle with complexities and interactions while using the public transit system, and the lack of order (rule following) that can make it difficult them to successfully drive.

Dr. Timothy Brown also presented at the workshop on the driving challenges that may affect these populations.

Chris Schwarz Publishes Report on Automation

Automated vehicles have been demonstrated on US highways, are actively being developed by several carmakers, and are the focus of current USDOT research and policy development.

The technology curve will lead us from level 1 automation, which encompasses electronic stability control (ESC) and active safety systems, into level 2 automation, where the driver may take both hands and feet of the controls and let the vehicle control its path. Higher levels of automation will allow the driver to stop monitoring the roadway for obstacles or the automation for correct behavior and completely disengage from the driving task and take a nap. The ultimate goal is full automation where the vehicle will remain in automated mode for the entire trip regardless of road type, weather, or other conditions.

Experts still disagree as to whether these vehicles are coming in the next 8 years, as claimed by some companies, or if if will take 20 years or more. Another point is whether vehicle automation can proceed without connected vehicle technology to support it, that is the ability for cars to communicate over networks to each other and to the infrastructure. These vehicles will have the potential to drastically reduce injury and deaths on US roads and highways and even change our concepts of car ownership in the future.