**THE
NATIONAL ADVANCED
DRIVING SIMULATOR**

THE
UNIVERSITY
OF IOWA

TheDriverSeat

NADS - THE NATIONAL ADVANCED DRIVING SIMULATOR - JANUARY 2012

New simulator rates for 2012 *
Now the highest fidelity research is more affordable!

NADS-1	$740 / hr	$2800 / day
NADS-2	$300 / hr	$1200 / day
miniSim	$50 / hr	$400 / day

* Prices subject to finalization

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The new face of NADS

This is an era of unprecedented change in vehicle safety and ergonomics. NADS is upgrading its capabilities and equipment to keep pace with this change. Our goal is to continue to provide the most advanced and sensitive research environments for studying human performance and vehicle safety.

The NADS's simulators are in the process of getting a modernized fleet of vehicle cabs. These include a 2012 Chrysler 200S and a 2010 Toyota Venza. In addition to having eye-trackers, hi-definition video cameras, EEG, biometric and posture sensors, both vehicles' user interfaces will be fully customizable to meet the research needs of tomorrow.

In addition, NADS is readying an instrumented vehicle: a 2012 Toyota Camry XLE. This vehicle will be used for on-road research studies in 2012 and will complement the simulation capabilities of NADS. The NADS suite of vehicles and simulators now represents the broadest range of fidelity at any research institution. The suite now includes a modern instrumented vehicle and simulators at different fidelities: high (NADS-1, the world's most advanced research driving simulator), medium (NADS-2) and several configurations of the affordable MiniSim simulators.

Sue Chrysler joins NADS as Director of Research

Dr. Sue Chrysler joined the NADS staff November 1st in the new position of Director of Research. Dr. Chrysler is well-known in road safety research circles and brings nearly 20 years experience in industry and academic research settings. Most recently, Sue was the Human Factors Program Manager at the Texas Transportation Institute where she directed all of the human factors research facilities, which included a driving simulator, instrumented vehicles, eye-tracking systems, two closed-course test tracks, as well as survey and focus group facilities.

New Project Highlight:
Novice Driver Education

Goal:	Train safer drivers; reduce collisions and fatalities
How:	Incorporate simulator technology to deliver "immersion" into the curriculum with expertly-supervised driving practice over time
Where:	Deliver driver's education through partnership with DrivingMBA® at retail automobile dealership locations and standalone properties

The DMBA Global/NADS partnership combines proven driving simulation technology with DMBA's proven effective training techniques. This combination and the proposed development results in a customized solution, rather than a 'make-do' solution resulting from adapting existing products.

NADS @ the 91st annual Transportation Research Board meeting
Jan. 22-26, 2012 | Washington DC | Booth: 1108

Please stop by our booth for the latest information on NADS research and MiniSim™ driving simulators. The Exhibit Hall Opening and Reception will be Sunday January 22 from 4pm to 7pm.

Dr. Sue Chrysler and Dr. Tim Brown are leading Human Factors Workshops. Sue is leading "Geometric Design Features and What Drivers Do with Them" and Tim is leading "If It Is Advanced, Automated, or Integrated Does That Mean It Works?".

Dr. Sue Chrysler will be honored with the D. Grant Mickle Award for the outstanding paper published in the field of operation, safety, and maintenance of transportation facilities. She will present "Operator Performance Measurement Using a Driving Simulator". Dawn Marshall will present "Differences in Degree of Conflict Accepted in Younger and Older Drivers with Lane-Change Collision Avoidance System".

Sue will be working with NADS staff and University of Iowa faculty researchers to develop research proposals and to ensure high-quality on-time delivery of a variety of projects.

She will continue her own research in the areas of driver-vehicle interfaces, driver distratction, roadway design, and traffic control devices. "I'm looking forward to new collaborations and enhancing my own research program with the excellent facilities at NADS", says Dr. Chrysler.

Welcoming our new MiniSim™ partners!

It's been a busy year for MiniSim at the National Advanced Driving Simulator, one in which we have added many new systems to a steadily growing user base. Current applications include research and driver training for cars and heavy trucks.

A few highlights for the MiniSim program:
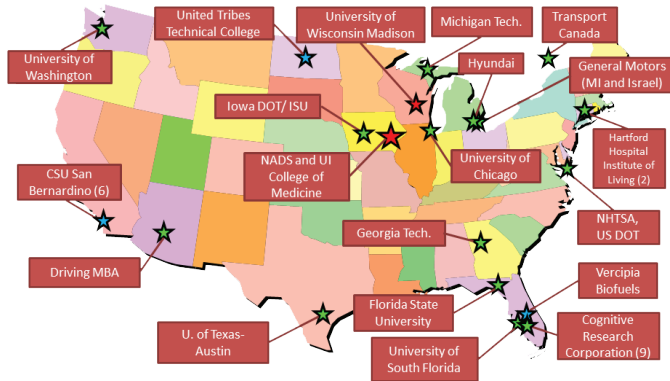
- Providing 6 Heavy-Truck MiniSims to CSU San Bernadino for research and training

- Working with DrivingMBA® on new functionality for driver training

- New MiniSims to Georgia Tech, Transport Canada, University of Chicago, Vercipia Biofuels, General Motors, Hyundai, Hartford Hospital Insitute for Living, and Cognitive Research Corporation

- Looking to add 10-15 sites in 2012

- New software features coming in 2012:
  - Weather effects
  - Instant playback
  - Adjustable mirrors
  - New GUI

Map labels: United Tribes Technical College; University of Wisconsin Madison; Michigan Tech.; Transport Canada; University of Washington; Hyundai; General Motors (MI and Israel); Iowa DOT/ ISU; Hartford Hospital Institute of Living (2); CSU San Bernardino (6); NADS and UI College of Medicine; University of Chicago; NHTSA, US DOT; Driving MBA; Georgia Tech.; Vercipia Biofuels; U. of Texas-Austin; Florida State University; University of South Florida; Cognitive Research Corporation (9)

Vehicle-based sensors detect alcohol impairment

NHTSA recently published the report on a NADS study on alcohol impairment detection. NADS collected driving behavior data from intoxicated drivers in a safe and controlled manner. The highest fidelity simulator in the United States allowed for precise characterization of driver response in realistic driving situations. This approach detects alcohol impairment using vehicle-based sensors to detect changes in drivers' behavior.

Data were collected from volunteer drivers from three age groups (21-34, 38-51, and 55-68 years of age) driving through representative situations on three types of roadways (urban, freeway, and rural) at three levels of blood alcohol content (0.00%, 0.05%, and 0.10% BAC).

Three different algorithms were developed to predict whether the driver was above the legal limit, using minimum speed, speed variability, and lane position and variability. The algorithms achieved an accuracy of approximately 80%, comparable to that of the Standardized Field Sobriety Test used by law enforcement.

Each of the three algorithms combined information across time to assess impairment. The time required to detect impairment using complex algorithms was as little as eight minutes.

This study demonstrates the potential of vehicle-based sensors to detect alcohol-related impairment in real time with sensitivity comparable to the Standardized Field Sobriety Test. These results are now being used in new studies detecting drowsiness, distraction, and even age-related cognitive decline.

The final report can be viewed at:
http://www.nhtsa.gov/DOT/NHTSA/NVS/Crash%20Avoidance/Technical%20Publications/2010/811358.pdf

Taking a turn in the right direction

Visualization Resources for Iowa State University and the Iowa Department of Transportation

Objectives include:

- Development of a conversion tool and/or utilities to convert Microstation design documents to real-time ready databases.

- Conversion of 2 IDOT J-Turn designs and the creation of 2 geo-specific real-time driving environments. Creation of 3-4 representative scenarios for each J-Turn site, to provide a means of experiencing the design site via simulation.

Recent studies @ NADS:

- Crash warning systems and interface metrics (NHTSA)
- Drowsy driver detection algorithms (NHTSA)
- Impairment Monitoring to Promote Avoidance of Crashes Using Technology (IMPACT)
- Distraction detection and mitigation systems (NHTSA)
- Validation of desktop simulators for sleep drug testing (Merck Pharmaceuticals)
- Left turning tractors and drivers (Great Plains Agricultural Center)

In December 2011, the University of Iowa was named a partner in Toyota's Collaborative Safety Research Center joining an elite group of Universities conducting a wide range of vehicle safety research.
http://www.toyota.com/csrc/toyota-teams-with-university-of-iowa-to-study-pre-drive-behavior-a70