THE NATIONAL ADVANCED DRIVING SIMULATOR
THE UNIVERSITY OF IOWA

TheDriverSeat

NADS - THE NATIONAL ADVANCED DRIVING SIMULATOR - JUNE 2013

Researcher Receives Driver Behavior Modeling Contract from Toyota

Susan Chrysler, Director of Research at the National Advanced Driving Simulator and adjunct associate professor in the College of Public Health, has received a three-year, driving safety-related contract from Toyota Collaborative Safety Research Center.

The project, formally called "Development of Driver Model for Driver Response and Crash Avoidance Behavior in Advanced Driver Assistance Systems (ADAS)" involves using the National Advanced Driving Simulator (NADS) -- a research unit of the UI College of Engineering. The research team also includes former Iowa Engineering professor Dr. John Lee, now at the University of Wisconsin-Madison.

Toyota's Collaborative Safety Research Center announced the UI project as one of several new research projects focused on the continued development of advanced crash modeling technologies and better protecting vulnerable populations.

Schwarz Granted U.S. Patent

On May 7, 2013, Chris Schwarz was issued U.S. Patent 8,437,936 B2 along with Kevin Moran of Nokia Location & Commerce and Robert Denaro, formerly of Nokia.

The patent deals with an enhancement to electronic stability control (ESC) by using digital map data. For example, map data that indicates a sloped, banked, curved, or narrow road may all be used to make the ESC system more or less sensitive, thereby improving the driver's chances to stay on the road.

ESC has been shown to be effective in saving lives. The National Highway Traffic Safety Administration (NHTSA) requires all new passenger vehicles to be equipped with ESC by 2012 and estimates that 5,300-9.600 lives will be saved annually once all passenger vehicles are equipped with the system. The ability of the NADS-1 simulator to put people in near crash situations was utilized in research studies for NHTSA and ESC system manufacturers over the past decade.

Click / scan to view the patent:
http://tinyurl.com/ntx7mdz

Recent Studies @ NADS:

- Haptic, audio and visual interfaces for crash warning systems
- Identification of state of the art in vehicle automation
- Emergency vehicle early warning systems
- Making simulators more useful for highway designers
- Driver state detection (impairment, distraction, drowsiness) using in-vehicle sensors

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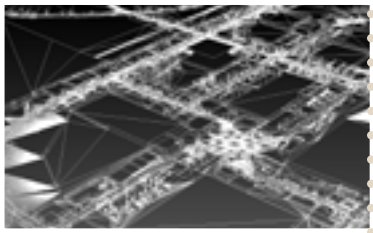
miniSim™ v2.0 Released

New features including:

- Updated operator interface
- 64-bit computing*
- Weather effects
- Support for dedicated turn lanes (right/left arrows at lights)
- Support of automatic generation of ambient traffic
- New vehicle dynamics models
- New tiles for the TMT (Clearview font on signs)
- Faster load times
- Ambient traffic automatically controls brake lights and headlights
- Driver controls for normal and high beam headlights

* Enables support for much larger environments



Recent miniSim conference appearances:

- **TRB**, Jan 13-17 Washington DC
- **SLEEP**, June 1-5, Baltimore, MD
- **Driving Assessment**, June 17-20, Bolton Landing, NY
- **Drug Information Association**, June 23-27, Boston, MA

New partners and projects:

- NHTSA miniSim upgraded
- University of Toronto
- Garmin International
- Battelle

Click / scan to browse a map of miniSim™ partners:

http://tinyurl.com/k4pupau

NADS Establishes Advisory Board

NADS has recently renewed its relationship with NHTSA through 2017 to operate and maintain the country's most advanced driving simulator. The help better position NADS to serve the future needs of our customers, an advisory board consisting of senior leadership from government, industry, small business and universities has been established. Board meetings are being held twice a year with the first meeting taking place this past March. Key areas for the Board to address include: reviewing/recommending research priorities; reviewing current research efforts and providing guidance on strategic planning; recommending equipment/capability upgrades to support long-term strategic plans; and providing planning inputs that define our way forward.

NADS has made transformational progress in the past few years in our focus areas and is working to confirm the University of Iowa as the leading public University for Driving Simulation Research.

Configurable Simulator Vehicle Cabs

The NADS offers a configurable vehicle cab environment for studying human behavior in situations involving impairment, distraction and crash warning technologies. The driver can be distracted with tasks involving interaction with touch screen displays that can be positioned at any location in the vehicle cab. A myriad combination of warning interfaces can be utilized to bring the driver's attention back to the road. These include a vibrating steering wheel, vibrating seat/back rest, seat belt tugs, lights on dashboard/instrument panel, and audio cues. Each of these interfaces can be configured to meet experimental needs. For example, the vibrating seat is fully customizable to support cues related to direction (forward, left, right, back). The steering wheel supports both passive and active alerts and can be customized to vibrate and steering the car back into the current lane.

Driver performance and behavior can be evaluated via measuring lane position, speed, reaction time and several other measures. The driver's head and eyes are tracked using a commercial grade head-tracker and a research grade eye-tracker. Scenario events are triggerable based on the driver's eye gaze and patterns in real-time. In short, NADS offers the most customizable driving environment of any transportation research lab in the country.

MATC Projects

NADS researchers will be working on two new projects funded by the MidAmerica Transportation Center, a regional University Transportation Center located at the University of Nebraska-Lincoln. The project will identify, rate and rank current and future technologies that affect the safety of older drivers and then determine their acceptance of those technologies. New vehicle-based safety systems have emerged in the US vehicle fleet in recent years. This project will identify and evaluate those in-vehicle systems that affect the safety of older drivers. Using NADS' extensive experience with vehicle safety systems and older drivers, a safety system ranking will be established by taking the composite safety rating of each in-vehicle technology and comparing it to the crash risk and the potential safety benefits of other available technologies. Older drivers' acceptance of these technologies will be assessed using a focus group setting and surveys and will factor into an overall safety score.