

**MECHANICAL ENGINEERING DEPARTMENT  
ME/ISyE 8773-8774**

**In-vehicle Technology to Correct Teen Driving Behavior:  
Addressing Patterns of Risk**

by

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**Wednesday, January 23, 2008**  
**3:15 p.m. — Refreshments before the seminar**  
**3:30 p.m. — Graduate Seminar**  
**Room 1130 ME**

**ABSTRACT** — More than five thousand teenagers lose their lives on roadways in the United States each year. These crashes account for 40% of all deaths among 15-20 year-olds, making motor-vehicle crashes the leading cause of death for this age group. Despite teen drivers making up only 7% of all licensed drivers, they are involved in nearly 14% of all fatal crashes across all age groups.

New approaches to reducing teen traffic fatalities are clearly needed. One approach requiring teens to complete a Graduated Driver Licensing (GDL) program in order to become fully licensed is designed with restrictions to limit the "exposure" of teens to certain risk factors during the learning period. These programs, which have achieved some success, do however suffer from weak compliance monitoring because they are primarily based on an honor system and depend on parental reporting.

A possible solution is through the use of vehicle-based driver support systems integrated with a GDL program. To be most effective, such systems should directly address the behaviors associated with the overwhelming number of teen fatal crashes: speeding, driver distraction/inattention, driver inexperience and physical impairment. In-vehicle technology offers an opportunity to address the issue of inexperience by providing contextual feedback to the learning driver during the crucial initial stages of driving. If successfully deployed, a Teen Driver Support System (TDSS), such as the one that will be described, could significantly decrease the number of teens killed in traffic crashes.

**BIO** — **Max Donath** is a Professor of Mechanical Engineering at the University of Minnesota and Director of its Intelligent Transportation Systems Institute, designated as a National University Transportation Center by the U.S. Congress. The ITS Institute under his direction since 1997, coordinates the efforts of approximately 30 faculty, 15 staff researchers and 100 students across several colleges, pursuing research in many areas including: human performance and behavior, driver interfaces, sensors, traffic and vehicle controls, and methodologies for crash mitigation. His recent efforts have been directed towards keeping the driver in the loop, using sensing technologies, control systems and improved human-machine interfaces to reduce driver error, and thus prevent crashes before they happen. He has led several major national initiatives on road-vehicle safety systems, most recently on new approaches to reducing the high incidence of fatalities at rural unsignalized intersections. He presently also leads efforts developing new systems to reduce lane departure, rear end crashes and teenage driver fatalities.