

Occupant Safety in Highly Automated Vehicles



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Professor

- **Mechanical and Aerospace Engineering**
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Dr. John Bolte is a professor in the School of Health and Rehabilitation Sciences at The Ohio State University College of Medicine. He is the director of the Injury Biomechanics Research Center (IBRC), a leader in the field of injury biomechanics, and is an expert in the experimental analysis of human injury tolerance and mechanisms under different conditions.

Dr. Bolte is on the Scientific Advisory Committee of the Stapp Car Crash Journal, he is an active member of the Society of Automotive Engineers, and is the host for the Injury Biomechanics Symposium in Columbus every year. Dr. Bolte is the site director for the Center for Child Injury Prevention Studies (CCHIPS). CCHIPS is an IUCRC focused on advancing the safety for children, adolescents and young adults.

Abstract

Over the past 30 years, researchers in the field of occupant safety have focused on increasing our knowledge of how to reduce injuries to the “50th percentile” male due to both frontal and sidecar crashes. Advances such as seatbelts and airbags have resulted from these studies which have been conducted using crash database mining, testing both post-mortem human surrogates (PMHS - cadaver) testing and anthropomorphic test devices (ATD – crash dummies) and simulating crashes using whole-body finite element modeling. Up until the past couple of years, the resulting passive safety features that emerged from the research have continually decreased the number of fatalities and severely injured occupants from crashes. According to many in the automotive field, we will continue to see an increase in vehicles that have active safety features which allow the occupants to turn over control of the vehicle to sensors and rapidly changing technology. Many project that within 5-15 years we will see an influx of vehicles that are completely automated and will not require any interaction of the occupants to control the vehicle. As a result, the occupant compartment of the vehicle will change potentially allowing for occupants to ride in a number of positions not currently available: rearward facing, fully reclined, oblique to the direction of travel, etc. During this time, due to the mix of automated vehicles along with human operated vehicles on the roads, crashes will still occur and passive safety features will still be needed to keep the occupants of both vehicles safe. Unfortunately, our knowledge of human response to these new loading conditions is severely limited. If it took 30 years for us to figure out how to keep the average male safe in 2 basic impact conditions; how much time do we need to keep all occupants (children, females, elderly) safe if seated in an infinite number of possible configurations?

**Thursday,
September 6**
11:45am – 1:00pm
Lunch Presentation



Hosted by Professor Marcelo Dapino

