



## Pasi Lautala

Assistant Professor, Dept. of Civil & Env. Engr  
Director, Michigan Tech Transp. Institute  
ptlautal@mtu.edu

### **Areas of research/expertise**

#### Rail Transportation

- Grade Crossing Safety
- Railway Operations
- Railway (Engineering) Education

#### Multimodal Transportation Logistics

- Biomass Transportation
- Comparative Life Cycle Analysis of Freight Transport Modes



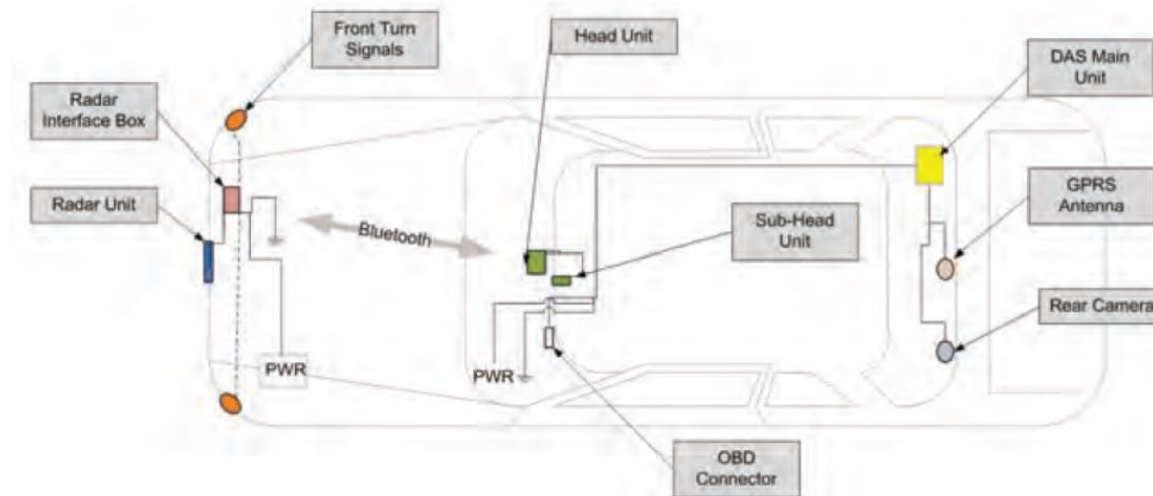
## Safe Mobility

- Safe operations (for now) depend on human perception and rational actions based on provided (engineered) warnings/guidance
- Warnings/guidance often developed based on empirical evidence, engineering experience, analysis, and judgement
- Objective evaluation of their effectiveness difficult due to “private” environment of individual vehicles
- How do we better align engineering and human elements to improve safe mobility?



## Strategic Highway Research Program Naturalistic Driving Study (NDS)

- Instrumented over 3,500 private vehicles
- Over five million trip records
- Includes front and rear video, throttle, brake, speed, acceleration and head tracking
- Can be “mined” to collect/analyze driver data (with restrictions)
- Related “route database” available (at Tech)



## Driver Behavior at Highway-Rail Grade Crossings Using NDS Data and Driving Simulators

- Two-year project funded by the Federal Railroad Administration
- Appx. 15,000 grade crossing traversals to determine driver compliance
- Automated methods for data reduction, head tracking, and scoring
- Trending analysis
- Validation of simulator experiments (Dr. Jeon)

