ABSTRACT

Our overarching goal is to address the need for driver-state detection through real-world measurements of driver physiology and behavior that can improve health and safety outcomes in at-risk medical populations. I will present a novel pilot study of 35 drivers with and without diabetes which implemented procedures for real-time measurements of blood glucose during naturalistic driving. Low and high blood glucose levels in drivers with diabetes can impair driving performance and increase risk. I will report the prevalence of at-risk blood glucose levels in drivers with diabetes, both during driving and outside of the vehicle. Preliminary data on patterns of at-risk driver behavior, as quantified through accelerometer data profiles, and its relationship to at-risk contemporaneous blood glucose profiles will be described both within an individual driver with diabetes and relative to control drivers. I will provide evidence that driver risk is difficult to quantify based on vehicle sensor data alone and must be assessed in relationship to real-time driver state and physiology. Combining sensor data and phenotypes of driver behavior can inform patients, caregivers, safety interventions, policy, and design of supportive in-vehicle technology responsive to driver state.

ABOUT DR. MERICKEL

I am a post-doctoral research associate in the Department of Neurological Sciences at the University of Nebraska Medical Center in the Mind & Brain Health Labs (PI: Dr. Matthew Rizzo). My research interests involve combining techniques from cognitive science, physiologic monitoring, and naturalistic behavior monitoring to improve real-world safety and treatment outcomes in at-risk medical populations. My academic background is in the study of infant language acquisition, spoken word recognition, and visual attention. I have experience in the design, implementation, and analysis of behavioral and cognitive experiments in the context of brain sciences and through a variety of experimental methodologies. My current research involves investigating 1) the relationship of fluctuating medication states to driving behavior in Parkinson’s disease, 2) quantifying physiologic changes in blood glucose to safety risk in diabetes, and 3) using in-vehicle sensor data to track and predict health and medical outcomes in older adults.