Lecture 5 In-Class Activity

The aim of this study was to examine the impact of the lead time for taking over control of automated vehicles and non-driving tasks on the behavior of drivers during the takeover process, with the goal of determining the optimal lead time range that would result in the most effective takeover behavior and greatest acceptance by drivers.

The Tukey Multiple Comparison Test or the Tukey HSD test is a statistical method for comparing multiple pairs of group means in a single analysis. It adjusts the significance level to account for multiple comparisons and is widely used in many fields. The test uses a simultaneous comparison approach, controlling the overall error rate, and provides a quick and effective way to make inferences about differences between means.

- The results of the Tukey multiple comparison test indicate that longer lead times resulted in fewer crashes compared to shorter lead times.
- A sharp decline in the crash rate as the lead time increased when the takeover request was delayed. But this trend slowed down when the takeover request was made early.
- At 3 seconds, the crash rate was significantly higher, compared to other lead times ($p<.001$ for each pair-wise comparison). The crash rate at 6 seconds was significantly greater as compared to the crash rate at 10 seconds ($p=.01$), 15 seconds ($p=.03$), 30 seconds ($p=.01$), and 60 seconds ($p=.03$).
- The results showed that the main effect of non-driving tasks was not significant on the crash rate.