Autonomous Vehicle Communication Strategies Modeled in Virtual Reality Dataset

Dataset available at: https://digitalcommons.lsu.edu/transet_data/102

(This dataset supports report **Autonomous Vehicle Communication Strategies Modeled in Virtual Reality**)

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The related final report **Autonomous Vehicle Communication Strategies Modeled in Virtual Reality**, is available from the National Transportation Library's Digital Repository at https://rosap.ntl.bts.gov/view/dot/61722.

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Abstract: We sought to better understand how autonomous vehicle (AV) communication strategies impact human road users' perceptions and behaviors. More specifically, we explored the impact of different external human-machine interface (eHMI) designs on understanding, task load, comfort, trust, acceptance, and reaction time. To accomplish this, we created virtual reality (VR) scenarios where human participants interacted with AVs. Participants experienced biking, driving, and pedestrian simulators and were brought back after initial testing to explore acclimation and learning effects. In terms of perceptions, the presence of an eHMI was the strongest predictor of understanding, comfort, trust, and acceptance outcomes in the statistical models when controlling for all other variables. There was a clear divide between text-based eHMIs and non-text eHMIs, with text-based eHMIs reporting better perception scores and the LED Windshield reporting the worst perception scores. There were perception acclimation effects detected (most notable for task load and comfort), but they had less of an impact than the presence of an eHMI. Perception outcomes had weaker relationships with participant characteristics than with AV characteristics. While behavioral outcomes should be interpreted with caution because of low participant sample sizes, behavioral results largely mirrored perception results in that significant reductions in reaction time were observed with the presence of an eHMI (3.69 second reduction), yielding (3.16 second reduction), and acclimation (0.134 second reduction per trial). Results suggest that eHMI design, AV behavior, and acclimation are most impactful in terms of both perceptions and reaction time.

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Dataset description:
This dataset contains 1 file described below.

Master_Survey_TranSET_Project_anonymized.xlsx:
The .xlsx and .xls file types are Microsoft Excel files, which can be opened with Excel, and other free available software, such as OpenRefine.

National Transportation Library (NTL) Curation Note:
As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (https://ntl.bts.gov/public-access) Section 7.4.2 Data, the NTL staff has performed *NO* additional curation actions on this dataset. NTL staff last accessed this dataset at https://digitalcommons.lsu.edu/transet_data/102 on 2022-05-25. If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.