A Machine Vision Approach for Estimating Motion Discomfort in Simulators and in Self-Driving Dataset

Dataset available at: https://doi.org/10.7910/DVN/ZHGT7U

(This dataset supports report **A Machine Vision Approach for Estimating Motion Discomfort in Simulators and in Self-Driving**)

This U.S. Department of Transportation-funded dataset is preserved by the SAFER-SIM University Transportation Center in the Harvard Dataverse Repository (https://dataverse.harvard.edu/), and is available at https://doi.org/10.7910/DVN/ZHGT7U

The related final report **A Machine Vision Approach for Estimating Motion Discomfort in Simulators and in Self-Driving**, is available from the National Transportation Library's Digital Repository at https://rosap.ntl.bts.gov/view/dot/56076

Metadata from the Harvard Dataverse Repository record:

Description: Motion discomfort in highly automated vehicles and in simulators represents a persistent problem that might be mitigated if it can be monitored. In driving simulators, motion discomfort can compromise data collection. In highly automated vehicles, motion discomfort can discourage people from riding in such vehicles, undermining the potential safety benefits. Monitoring motion sickness in real-time can help mitigate its negative consequences. This report investigates the potential of machine vision techniques in estimating motion discomfort in realtime for both, simulators and highly automated vehicles. Drivers' video data and simulator sickness scores collected in the NADS driving simulator were analyzed. The video data were reduced to the facial action units (basic units of facial expressions) and head pose estimations. While results did not show significant correlations between motion score and facial expressions, we found a significant correlation between the drivers' head position and motion sickness severity. One important outcome of this project was a computer-aiding tool for manual coding of videos. The tool can be used to advance research on the topic of motion sickness and also in other fields and areas that rely on video analytics like affective computing. (2019-12-01)
Subject: Engineering

Recommended citation:

Lee, John D.; Alsaid, Areen, 2020, "A Machine Vision Approach for Estimating Motion Discomfort in Simulators and in Self-Driving", https://doi.org/10.7910/DVN/ZHGT7U, Harvard Dataverse, V1

Dataset description:

This dataset contains 2 files described below.

- **Ms.data.csv**
- **MS.head.pose.csv**

The .csv, Comma Separated Value, file is a simple format that is designed for a database table and supported by many applications. The .csv file is often used for moving tabular data between two different computer programs, due to its open format. The most common software used to

open .csv files are Microsoft Excel and RecordEditor, (for more information on .csv files and software, please visit https://www.file-extensions.org/csv-file-extension).

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://doi.org/10.7910/DVN/ZHGT7U on 2020-07-07. 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.