

CSE523 - Machine Learning

Weekly Report 3

**Classification of Drivers based on their Driving Patterns**

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The paper "The highD Dataset: A Drone Dataset of Naturalistic Vehicle Trajectories on German Highways for Validation of Highly Automated Driving Systems" introduces the highD dataset, a comprehensive collection of vehicle trajectory data captured via drones over German highways. Here are the key pointers focusing on the dataset's characteristics:

**1. Objective:** Developed to support the safety validation of highly automated driving systems through scenario-based testing, relying on real-world traffic data.

**2. Data Collection Method:** Utilizes drones equipped with high-resolution cameras to capture traffic flow from an aerial perspective, ensuring unobtrusive, naturalistic driving behavior.

**3. Dataset Composition:** Contains 16.5 hours of recordings from six different locations, featuring 110,000 vehicles with a total driven distance of 45,000 km, including 5,600 recorded complete lane changes.

**4. Resolution and Quality:** Videos were recorded in 4K resolution at 25 fps, ensuring high-quality data for detailed analysis.

**5. Data Processing:** Implements computer vision algorithms for automatic vehicle detection and tracking, with post-processing for smooth trajectory data.

**6. Maneuver Annotation:** Includes a set of predefined maneuvers such as lane changes and vehicle following, extracted using rule-based algorithms.

**7. Dataset Accessibility:** The highD dataset is publicly available online, along with tools for data handling and maneuver extraction.

**8. Comparative Advantage:** Offers a larger scale and higher variety of data compared to other datasets like NGSIM, with better resolution and vehicle detection accuracy.

**9. Dataset Use Cases:** Aims to foster research in traffic simulation models, traffic analysis, driver models, and road user prediction models, among others.

This dataset represents a significant advancement in the collection and analysis of naturalistic driving data, offering extensive resources for researchers and developers in the field of automated driving systems.

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### **References:**

R. Krajewski, J. Bock, L. Kloeker and L. Eckstein, "The highD Dataset: A Drone Dataset of Naturalistic Vehicle Trajectories on German Highways for Validation of Highly Automated Driving Systems," 2018 21st International Conference on Intelligent Transportation Systems (ITSC), Maui, HI, USA, 2018, pp. 2118-2125, doi: 10.1109/ITSC.2018.8569552. keywords: {Roads;Sensors;Drones;Trajectory;Safety}