Analyzing Human Driving Data - An Approach Motivated by Data Science Methods

Abstract:

By analyzing a large data-base of car-driving data in a generic way, a few elementary facts on car-following have been found out. The inferences stem from the application of the mutual information to detect correlations to the data. Arguably, the most interesting fact is that the acceleration of the following vehicle depends mostly on the speed-difference to the lead vehicle. This seems to be a causal relationship, since acceleration follows speed-difference with an average delay of 0.5 s. Furthermore, the car-following process organizes itself in such a manner that there is a strong relation between speed and distance to the vehicle in front. In most cases, this is the dominant relationship in car-following. Additionally, acceleration depends only weakly on distance, which may be surprising and is at odds to a number of simple models that state an exclusive dependency between acceleration and distance.