Exploring Survey Methods for Acquisition of Mobility Data

Bachelorarbeit SS2020   **Sviatoslav Pavlov**

Abstract

Traffic data is fundamental for assessing current and past performance and supporting decision-making, as it provides the ground for understanding traffic flows and serves as a starting point for engineers and government officials to intelligently plan for the future. This bachelor thesis presents an overview of current as well as new and emerging technologies and procedures for traffic monitoring. Specifically, will be discussed and examined the advantages and limitations of every approach. Furthermore, will be provided practical case studies of implementing the latest technologies for collecting traffic data and developing traffic monitoring programs.

Methodology

The data for this thesis was acquired from most up to date reliable sources: first of all University Researches (e.g. University of Minnesota Duluth, University of Calabria). Primarily these researches were targetted at examining one specific monitoring technology (e.g. Using Smartphones As a Tool To Capture Road Traffic Attributes), as a result, the findings from such independent studies were very using for assessing the accuracy and limitations of certain technologies.

Secondly, for building my background knowledge on traffic monitoring technologies, I went through different traffic agencies guidelines (e.g. Guidebook on Pedestrian and Bicycle Volume Data Collection, Exploring Pedestrian Counting Procedures), and companies datasheets. The information from those sources was very useful for getting an overview of the current state of practice.

Thirdly, I attended a few webinars, hosted by Ouster, for a better understanding of lidar technology: working principle, accuracy, and reliability.

Results

The findings of the research indicate that the traffic data is becoming more digitalized and with the enrollment of artificial intelligence, automated tracking and monitoring systems are substituting outdated technologies. Most apparent this trend can be seen when looking at new and emerging practices due to the latest technological advances, these include automated laser and radar traffic detection systems and onboard traffic tracking devices.

As technology gets more reliable and accurate, researchers and officials can get real-time metrics such as average speed, live traffic events, vehicle counting, and origin-destination patterns. However, high-quality data comes with an extra cost, for example, Leddar T16 costs between 3,300€ and 4,000€, whilst the price of a Hawkeye Radar ranges between 15,000$ and 25,000$.

Furthermore, there is still plenty of specific challenges that could be addressed in further researches, amongst others for example establishing certain control standards and quality assurance for urban count data and understanding travel patterns of non-motorized traffic.

Leddar T16

Hawkeye Radar

Conclusio

There are many different types of monitoring systems on the market. Yet, no sensor, considered in this study, can very precisely and accurately detect and track pedestrians, cyclists, or vehicles. Meaning that the detection accuracy can only be significantly improved by fusing the data from multiple sensors. Judging by the rate of technological advances, we will be seeing more effective and efficient ways to collect, process, and store traffic data as industries and researches will be making the use of new resources, know-how, and equipment.