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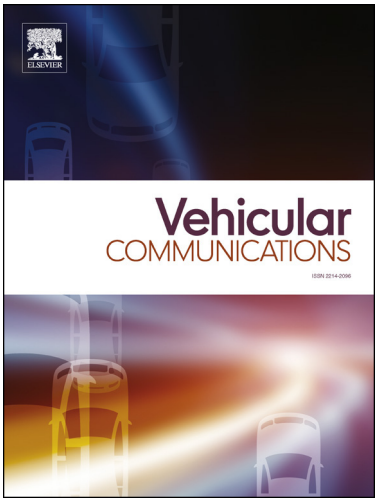

Big Autonomous Vehicular Data Classifications: Towards procuring Intelligence in ITS

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Big Autonomous Vehicular Data Classifications: Towards procuring Intelligence in ITS

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Abstract - *For effectively utilization of acquired resources in Autonomous Vehicle (AV), big data analysis in real time will be a reliable way to produce valuable information from sensor data. With the combined ability of telematics and real-time analysis, big data analytics forming the key drivers of autonomous cars. To emphasize the significant of data fusion or knowledge discovery, an efficient architecture has been proposed for real-time big data analysis in an autonomous vehicle, which indeed will keep pace with the latest trends and development with respect to emerging big data paradigm. The proposed architecture comprises distributed data storage mechanism for a streaming process for real-time analysis and the vehicular cloud server tool for batch processing the offline data. Furthermore, a workflow model has also been designed for big data architecture to examine streaming data in near real time process. Furthermore, an algorithm is developed for data classification in distributed storage unit, and mathematical modeling is carried to analysis the data classification functionality in AV. The proposed system model using Hadoop framework which is for the optimal utilization of the massive data set, meant for data classification in distributed environment for streaming data in real time, which is intended for intelligent transportation of the autonomous vehicle.*

Keywords*:* Autonomous Vehicle, knowledge discovery, distributed data storage, real-time analysis, Data Classification, ITS (Intelligent Transportation System)

1. Introduction

To move self-driving cars from vision to reality, auto manufacturers depend on enabling electronic technologies for sensing, sensor fusion, communications, high-performance processing and other functions. There is various sensor deploy in autonomous vehicles, which provides a vast amount of data, that needs an adequate real-time processing mechanism for efficient transportation. The sensor information from various electronic sensors which captures information about the surrounding environment of the vehicle, the captured data would be raw in order to extract the meaningful information knowledge extraction or particular intelligence is needed as shown in Fig 1. A high-performance, the centralized processor, is required for data fusion and which also analyzes the massive amount of sensor data, extract high-level meaning, and make decisions about what the vehicle should do. Before data fusion mechanism, preprocessing the raw data plays a dominant role and also ETL (Extract, Transform & Load) plays a vital role.

After preprocessing, to integrate information from various sources, we need to classify the data sets accordingly its functionality. After classification to acquire the knowledge we need a centralized sensor fusion mechanism as shown in Fig 1. Furthermore, single sensor information will consume predominant time, and it requires excess bandwidth.

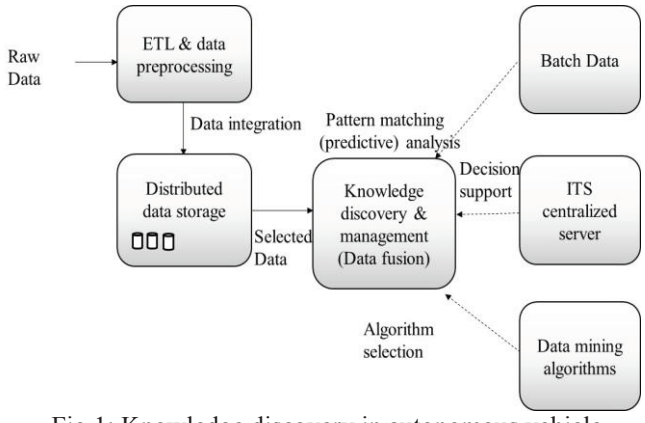

Fig 1: Knowledge discovery in autonomous vehicle

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