

**Industrial Consultancy & Sponsored Research (IC&SR)**

**A METHOD AND SYTEM FOR PREDICTING A VEHICLE TRAVEL TIME**

**IITM Technology Available for Licensing**

**Problem Statement**

- Existing technologies on travel time prediction for public transportation are limited and are mainly designed for homogeneous and lane-disciplined traffic conditions that may not perform well in mixed-traffic conditions, especially in highly populated and congested cities
- In addition, there are challenges in applying deep learning to vehicle travel time prediction, especially in mixed-traffic conditions.

**Intellectual Property**

- IITM IDF Ref. 2110
- IN202141005606

**Technology Category/ Market**

**Category –Automotive**

**Applications** – Transport systems, Automation, Automobiles

**Industry –Automotive/ Transportation Systems**

**Market** -The global intelligent transportation system market is projected to grow from \$22.91 billion in 2021 to \$42.80 billion in 2028, at a CAGR of 9.34%

**Technology**

**Method:**

**Data Collection:** Receiving a collection of trip data, which includes both location data and timestamp data for multiple trips on a specific route

**Determining Travel Times:** Travel times, the time taken by the vehicle to traverse each segment of the route, are determined for each trip based on the collected data.

**Creating Travel Patterns:** Creates travel patterns for each route based on the travel times collected over a predefined time interval that include information about temporal variation and spatial variation

**Prediction:** Predicting the vehicle travel time during next instance when the vehicle travels in the same route using the travel pattern

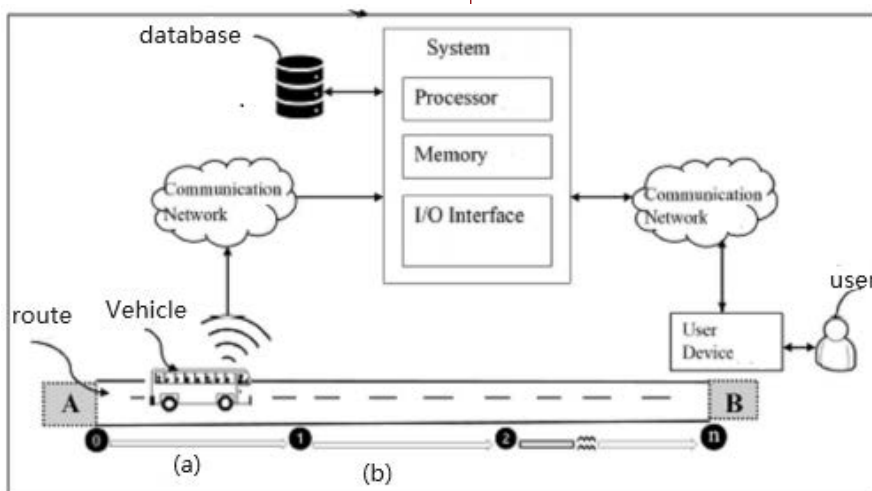


Fig.1 shows an exemplary environment of a system for predicting vehicle travel time

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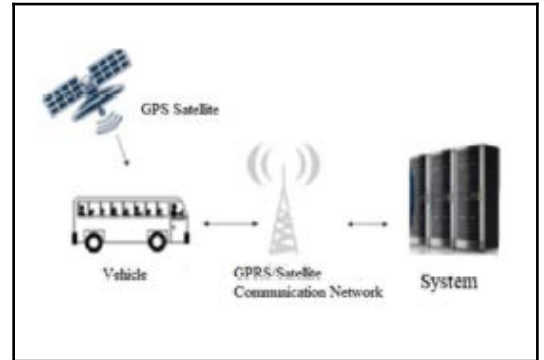
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- ❑ **Temporal variation** –Based on how travel times change based on the time of day or day of the week
- ❑ **Spatial variation** –Based on how travel times vary between different segments of the route, possibly due to traffic or other factors
- ❑ The travel pattern for each route is determined based on input features obtained using visualization method and statistical test
- ❑ The said visualization method comprises heat maps and the statistical test comprises at least one of K-means clustering and Davies-Bouldin (DB) score
- ❑ The invention also discloses a system with components for data collection, determination of travel times, creation of travel patterns, and prediction having a unit for generating a travel time predicting model.
- ❑ The travel pattern for each route is determined based on similarity analysis and correlation analysis of the different travel times



**Fig.3** shows an illustration where which trip data of a vehicle is received by the system through a GPRS/ satellite Communication network

### Key Features / Value Proposition

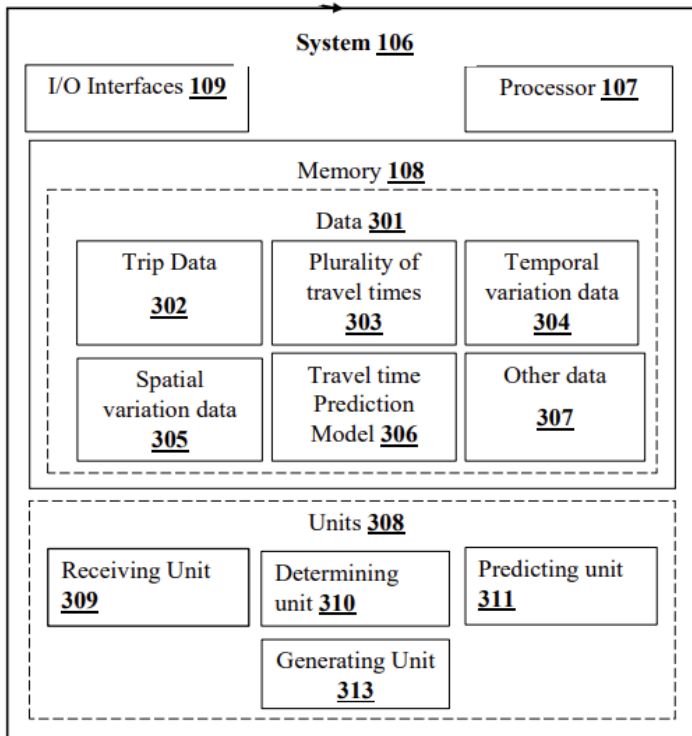
#### Technical Perspective

- ❑ Provides a system and a method for predicting vehicle travel time in route network with **non-homogeneous and mixed traffic conditions**
- ❑ Use deep learning techniques for travel time prediction based on travel patterns considering spatio-temporal variation for each route thereby **enhancing the accuracy, ease and reliability of travel time prediction.**

#### User Perspective

- ❑ Travel patterns are created can vary, ranging from hours to days, months, or years, **depending on the requirements and the level of detail needed for predictions.**
- ❑ The system can be valuable in applications like traffic management, route optimization, and transportation services.

### Images



**Fig. 2** shows a block diagram for the system for predicting vehicle travel time

### TRL (Technology Readiness Level)

**TRL-4/5**, Technology Validated in relevant Environment

### Research Lab

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