

INDUCTIVE LOOP SENSOR DEVICE

IITM Technology Available for Licensing

Problem Statement

- ❑ Accurate real time measurement of traffic parameters such as flow, speed etc., is the most critical component of any successful Intelligent Transportation Systems
- ❑ Existing technologies for vehicle detection Inductive Loop Detector (ILD) technology is lane based and hence will not be able to take into account the no-lane disciplined traffic

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%

Key Features / Value Proposition

Technical Perspective

- ❑ The present invention discloses composite Inductive Loop Sensor device for vehicle detection, detecting vehicles on lane disciplined road ways and also on no-lane disciplined road ways
- ❑ Multiple inductive loop system where multiple numbers of the proposed single loop are arranged in a suitable way in the roadways to take into account the lack of lane discipline.

User Perspective

- ❑ The multiple loop system can classify various types of vehicles and detect their speed.
- ❑ The system is designed to provide information about the type, direction, speed, and number of vehicles passing over the loops.

Technology

The inductive loop sensor device for vehicle detection for the present invention comprises :

<ul style="list-style-type: none"> • Composite Inductance Loop • Contains large outer loop (portion A) and a small inner loop (portion B) 	<ul style="list-style-type: none"> • Detection Means • Inductance of both the outer loop (A) and the inner loop (B) changes when vehicles pass over the loop.
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- ❑ The device consist of multiple composite inductance loops (Lp) connected to the detection means.
- ❑ Both the outer loop (A) and inner loop (B) are described as having multi-layered multi-turn windings, and the composite loop (Lp) consists of these loops connected in series.
- ❑ The detection means is connected to alternative loops at any specific instance, which helps to activate either odd or even number loops using a switching means, thereby reducing cross-sensitivity effects between neighboring loops.

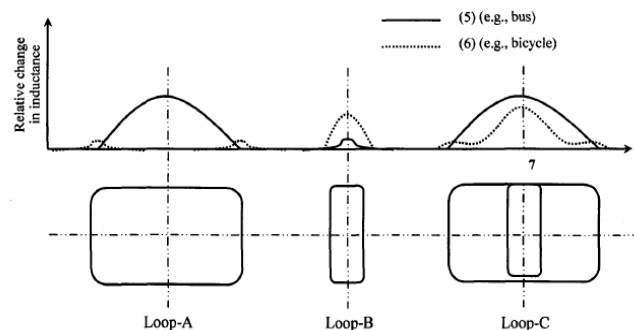


Fig.1 Illustrates a pictorial representation of the relative change in inductance for the inductive loops A, Band C

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- ❑ The detection means is designed to analyze the relative timing and sequence of detection signals in the composite loop (L_p) to determine the direction of vehicle travel and the speed of the vehicle based on the duration of detection signals
- ❑ The composite loop (L_p) is placed transversely to the traffic flow direction in the roadway and can classify the vehicles too.
- ❑ The detection means is also adapted to detect the number of parallel movements of multiple vehicles on the roadway by analyzing signals from the composite loops.
- ❑ For example the relative change in inductance noticed will be sufficient enough to detect the object reliably such that outer loop is mainly sensitive to large objects and inner loop is sensitive to small vehicles.

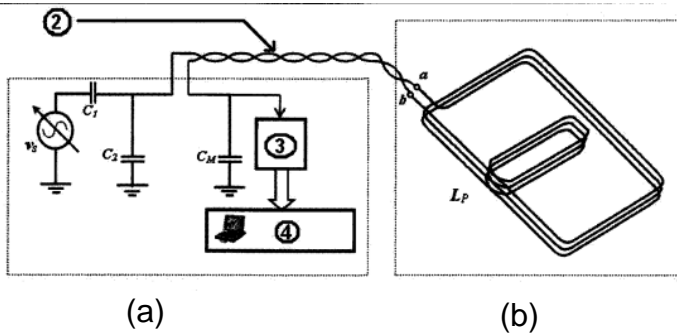


Fig.2 Simplified diagram of the detection means comprising of a resonant signal conditioning circuit, a Data Acquisition Unit (3), Computer (4) and Cables (2).

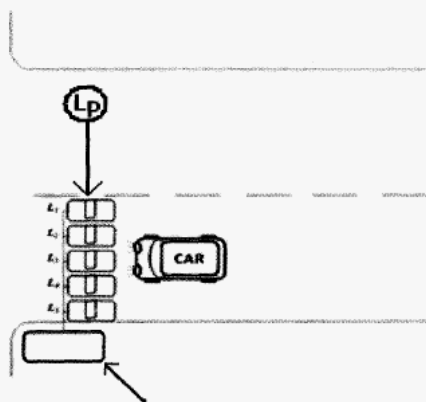


Fig.3. Illustration of the Car riding over multi-loop vehicle detector

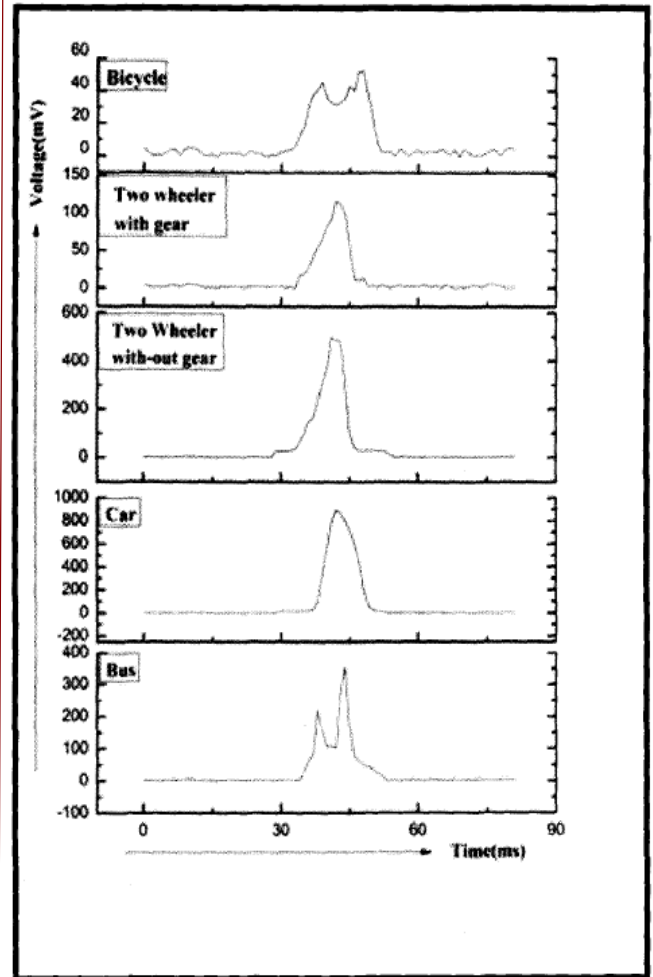


Fig. 4. Illustration of the Signatures obtained for different vehicles detected

Intellectual Property

- IITM IDF Ref. 840
- IN341092-Granted

TRL (Technology Readiness Level)

TRL-3, Experimental Proof of Concept

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