**SMART SOLUTIONS FOR RAILWAYS**

# TEAM ID : PNT2022TMID42281

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**LITERATURE SURVEY**

A **literature review** is an overview of the previously published works on a specific topic. The term can refer to a full scholarly paper or a **section** of a scholarly work such as a book, or an article. Either way, a literature review is supposed to provide the researcher/author and the audiences with a general image of the existing knowledge on the topic under question. A good literature review can ensure that a proper research question has been asked and a proper theoretical framework and/or research methodology have been chosen. To be precise, a literature review serves to situate the current study within the body of the relevant literature and to provide context for the reader. In such case, the review usually precedes the methodology and results sections of the work.

Producing a literature review is often a part of graduate and post-graduate student work, including in the preparation of a [thesis](https://en.m.wikipedia.org/wiki/Thesis), [dissertation](https://en.m.wikipedia.org/wiki/Dissertation), or a journal article. Literature reviews are also common in a [research proposal](https://en.m.wikipedia.org/wiki/Research_proposal) or prospectus

A literature review can be a type of [review article](https://en.m.wikipedia.org/wiki/Review_article). In this sense, a literature review is a [scholarly paper](https://en.m.wikipedia.org/wiki/Scholarly_paper) that presents the current knowledge including substantive findings as well as theoretical and methodological contributions to a particular topic. Literature reviews are [secondary sources](https://en.m.wikipedia.org/wiki/Secondary_sources) and do not report new or original experimental work. Most often associated with academic-oriented literature, such reviews are found in [academic journals](https://en.m.wikipedia.org/wiki/Academic_journals) and are not to be confused with [book reviews](https://en.m.wikipedia.org/wiki/Book_reviews), which may also appear in the same publication. Literature reviews are a basis for research in nearly every academic field.

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| S.NO | TITLE | AUTHORS | DESCRIPTION |
| 1. | Automatic Fault detection of Railway Track system Based on PLC(ADOR TAST). | Naveen Bhargav | International Journal of Recent Research Aspects.The sensor is used to detect defect in the train track and the ultraviolet sensor is used to detect the obstruction in front of the train. Precise location of a heavy freight train and its main parameters. |
| 2. | Railway track fault detection system using IR sensors and Bluetooth technology. | Siva Rama Krishna. B | Asian Journal of Applied Science and Technology(AJAST).  In the event of any defect on the track it will detect track defect using IR sensors and then it sends a message to the Android. Applications of modern predictive control methods, analysis tools and techniques for condition monitoring systems. |

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| 3. | Expert systems | Rabatel | Anomaly detection in complex maintaiance operation. Precision is in all case above 90% limiting both the number of false alarms and the number of undetected anomalies. |
| 4. | State-of-the-art, analytics, sensor fusion and big data. | Thanduri | Precise location of a heavy freight train and its main parameters.  Adjust the maintenance needs and track speed limits  dynamically using embedded sensors. Experimental results of  the implementation. |
| 5. | State-of-the-art | Soh | Different strategies for preventive maintenance scheduling  problem: hybrid genetic algorithms, ontology-based modeling,  heuristic approaches and strategic gang scheduling. Big Data  Maintenance decisions regarding railway tracks, all parts of  the track can be monitored with appropriate intervals while  maintaining the processing load within feasible limit. |
| 6. | Expert systems, DSS,  ontologies | Turner | Knowledge based systems to develop a prototype for  maintenance scheduling.  WSN, Zigbee  Monitoring system for slab track infrastructures using an energy  consumption optimization strategy.  WSN, remote monitoring  Monitor the slope deformation, the variation in the internal stress  and the PPV (Peak Particle Velocity) in an existing slope adjacent  to a railway track.  WSN  Early warning system for infrastructure surveillance and  threat detection. |

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| 7. | Key update scheme Secure key establishment for train-to-infrastructure networking. | Bennetts | Secure key establishment for train-to-infrastructure networking.  State-of-the-art Securing railways: plans against the identifified threats. |
| 8. | Sensors, ultrasonic  probeheads, numerical  models | Kouroussis | Overview about the static and dynamic behaviour of ballasted  railway tracks in SHM. Estimation of stress transfer from the train  passage to the track using predictive numerical models.  State-of-the-art, WSN  General applications, SHM network topology and deployments,  hardware/software properties, communication protocols and  standards; and energy harvesting solutions.  State-of-the-art, WSN Integration of different types of sensors for SHM.  State-of-the-art, WSN  Qualitative and quantitative analysis of WSN requirements,  accurate timing and synchronized sensing for high sampling  rate sensors.  Sensors, ultrasonic  probeheads, numerical  models  Tests over a railway truss bridge. |
| 9. | Artifificial intelligence,  dynamic programming  and genetic algorithm | Franceschinis | Development and experimental results of a liquid level sensor  based on a fifiber Bragg grating for monitoring differential  settlement of railway track. WSN, feature extraction Analysis of the vibration patterns caused by trains passing by. Time-synchronized network for SHM, the design includes channel  measurements, network topology and architecture, physical  and MAC layer design and network discovery. Performance  evaluation show maximum sampling synchronization jitter values  within 1µs for sensor nodes belonging the same base station, and  2µs for nodes of different base stations.  Modeling the physical topology optimization for SHM. |
| 10. | Video analytics, artifificial  intelligence | Tutcher | Security management system integrating heterogeneous intrusion  detection, access control, intelligent video-surveillance and sound  detection devices. Probability of detection of at least the 80% for  most alarms (including motion detection, unattended luggage,  yellow line crossing) and a false alarm rate of less 10 nuisance  alarms per day.  Comprehensive video surveillance and management platform,  successfully applied in the operation of Suzhou Subway Line 1.  Framework with detection models for the evaluation of  threat detection. |

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| 9 | Dynamic forecasting,  stochastic comparison |  | Hamid | Revenue management in intermodal transportation.  Resource management for containerized cargo transportation. |
| 10. | Multi-commodity flflow  problem, probabilistic  mathematical model |  | Sirikijpanichkul | Monitoring of rolling bearing in freight trains, comparison of  different routing protocols and use of data compression and  coding schemes based on lifting integer wavelet and Embedded  Zerotree Wavelet (EZW) algorithms.  Monitoring of freight trains transporting hazardous materials.  Analysis on network performance by measuring the packet loss  rate on different nodes in two working conditions: train standing  in the station and train running.  Performance monitoring of track transitions under different  loading environments. Identifification of different factors  contributing towards this differential movement, as well as  development of design and maintenance strategies to mitigate  the problem.  bilevel optimization  Revenue management for rail freight using bilevel mathematical  formulation which encompasses pricing decisions and  network planning. |