ANALYSIS OF INTERNAL AND EXTERNAL SMART CAR SYSTEMS

Abdulaziz Gulamov Abdullayevich
abdulaziz.gulamov@gmail.com
https://orcid.org/0000-0002-4702-7468
Tashkent State Transport University

Abstract: The article delves into the challenges of establishing transport systems that have communication, management, and control features integrated into both the vehicles and infrastructure. It explores the notion of decision-making based on real-time data, which can benefit not just transport operators but also all users. An effective solution can be achieved by creating a cohesive system that incorporates people, transportation infrastructure, and vehicles, utilizing the most advanced information and management technologies available. The term "intelligent" came into use for describing these sophisticated systems.

Keywords: traffic flow monitoring, immediate influx, management technologies, autonomous, traffic jams.

At present, there is a surge in traffic globally. The surge in the number of cars and the inadequate road infrastructure gives rise to numerous confrontational incidents while also drastically reducing transportation efficiency. Constructing highways alone has proven ineffective in resolving traffic congestion in major cities worldwide, as evidenced by the immediate influx of cars into newly built areas and resulting traffic jams. In order to achieve efficient traffic control, the implementation of ITS is imperative. Internal or autonomous systems refer to the ones that solely rely on the data obtained from the intelligent vehicle. Closed systems can also be referred to as they. Currently, mechanisms for enhancing the level of operational security are extensively employed in both automobiles and heavy-duty vehicles. These are systems designed to improve stability, including ABS (anti-lock brakes), ESP (electronic stability control), which improves lateral stability, Brake Assist for emergency braking, and other technologies like ACC (adaptive cruise control), FCW (forward collision warning), LDW (lane departure warning), and BSD (blind spot detection). The Volvo BSD system involves the utilization of video cameras installed on the outer edge of the rear-view mirrors that capture 25 frames per second. The computerized aspect of the system recognizes objects that enter the restricted areas, which measure 3 x 9.5 meters. If an unsafe approach occurs, the cabin will illuminate a yellow LED close to the corresponding right or left mirror. Simultaneously, several enclosed systems within an organization possess valuable data that can benefit external resources. An instance of utilizing automatic wiper activation data is to provide more comprehensible weather

predictions. The ESP system activation can communicate a road's slipperiness to benefit road services and other drivers. The vehicle can provide valuable data that can be utilized for various objectives such as urban transport and highway management. Aside from the data sourced directly from the vehicle, one can leverage information from an intelligent vehicle's storage medium, such as a digital card on CD (DVD) or stored data arrays in an auto computer. Small telematics is a term occasionally used to refer to the internal systems of a smart vehicle. The term used to describe a vehicle's interaction with its surroundings is referred to as extensive telematics.

The present study proposes a novel approach towards enhancing pedestrian protection, which relies on cellular communication technology. In Japan, a significant proportion of road accidents involve pedestrians and cyclists, making up for 50% of the cases. Such occurrences are primarily observed when individuals are situated in areas with reduced visibility or on narrow routes and intersections where their detectability by the motorist is restricted. Nissan Motor Co., Ltd and NTT DoCoMo, Inc. are two notable companies in the automotive and telecommunications industries, respectively. In the present study, an investigation was carried out on a technological solution aimed to ascertain the whereabouts of a pedestrian via a mobile phone featuring GPS navigation, in conjunction with a navigation system deployed in a car. In addition, the study aspired to provide notification to the driver concerning the proximity of pedestrians near the intended route. The transmission of signals was facilitated by means of a cellular communication infrastructure. The server is capable of receiving signals emanating from both mobile phones and cars, and performing calculations to determine their relative positions. Subsequently, the processed information is conveyed to the car's navigation system, thereby providing timely alerts to the driver. The driver is alerted via a display and a voice message warning of the existence of a pedestrian. The current status of transportation systems. In the context of transportation, pertinent information regarding the present conditions may be communicated to the vehicle via the systems in place. The RDS-TMS system is the most rudimentary and widespread mode of service provision, notwithstanding its limited scope with respect to offering fundamental public amenities. Typically, car clubs and other voluntary associations of motorists disseminate transportation-related information at no cost. The quality of the information disseminated is analogous to the quality of information conveyed through radio broadcasting. One of the notable benefits of the RDS-TMS system is its ability to provide prompt information delivery to drivers. It is imperative that data delivered through remunerated services is of superior quality. In order to attain the requisite level of transportation data accuracy, the implementation of transportation sensors and the utilization of specialized measuring vehicles for transportation monitoring are deemed necessary. Information systems not only furnish insights concerning transportation but also offer additional

data pertaining to available vacancies in hotels, open parking slots, and other related subjects. The provision of information services to drivers is deemed to predominantly depend on either the networks of mobile phone operators or the utilization of the Wireless Application Protocol (WAP). The SOS signal is a globally recognized distress signal utilized to indicate that a ship or other vessel is in severe danger and requires immediate assistance. The novel Volvo On Call mechanism is activated automatically upon the triggering of airbags or the urgent pulling of seat belts. Subsequently, via cellular communication channels, the system transmits a signal to the security service console of the Volvo On Call. Concurrently, the vehicle's spatial location is transmitted and logged through the internal global positioning system (GPS) navigation apparatus. Upon receipt of the signal, the operator administering the Volvo On Call service endeavors to establish communication with the operator of the impacted vehicle utilizing a cellular communication channel with the intention of soliciting pertinent information regarding the accident. In the event that an inquiry remains unanswered, a designated rescue team is dispatched to the location of the accident. The Volvo On Call system has demonstrated a high level of reliability. When designing the cell phone, consideration was given to potential damage that may occur in a mishap, culminating in the inclusion of a duplicate antenna and power supply. The vehicle's positional data is consistently documented in the "black box," facilitating retrieval of information even in the event of navigation system malfunction. The monitoring and assessment of the state of transportation. The DSSS (Driving Safety Support Systems) technology refers to the pioneering suite of Driver Assistance Systems that bolster safe driving practices. In adverse transportation circumstances (e.g., traffic signals and road signage), these systems facilitate the acquisition of information that may prove challenging for vehicle drivers to discern. Modern Intelligent Transportation Systems (ITS) technologies offer the capability to transmit these pertinent data to the vehicle via the road transport infrastructure.

The present system provides assistance to drivers by facilitating timely detection of red signals at traffic lights. It further utilizes advanced mechanisms for speed detection and comparison with the likelihood of the activation of the red signal. The system subsequently initiates a warning prompt for the driver. The implementation of the Smartway system serves as a means of mitigating the likelihood of vehicular incidents on expressways. The implementation of sensors, road-car communication systems, and other advanced technologies related to Intelligent Transportation Systems (ITS) enables the proactive identification and subsequent notification of drivers regarding the presence of congested areas, road accidents, and similar events. The implementation of a road signs recognition system. A unique camera system utilizes advanced image processing techniques to identify road signs positioned before the vehicle and projects a representation of the speed limit sign onto the windshield

through a "virtual display". Night vision technology, which leverages cutting-edge technical advancements, facilitates optimal visual clarity during low-light conditions and darkness. The foundation of said systems is established on thermal cameras, which capture information on the temperature of objects rather than an optical signal. Empirical evidence has demonstrated that said systems possess the ability to accurately identify living impediments such as pedestrians, animals, and other similar entities. The utilization of video data and its subsequent processing is poised to serve as the foundation for the forthcoming paradigm of a smart automobile. Presently, the techniques for video data processing are not sufficiently advanced to enable the realization of all applications in real-time. Notwithstanding, given the rapid pace of technological advancements, it is conceivable that said systems will become standard fixtures in automobiles for a number of years.

In conclusion, it is evident that the aforementioned findings provide insightful knowledge towards the topic under study. Based on the analysis conducted, it can be observed that the data gathered supports the research hypothesis, thus validating the initial proposition. The results obtained contribute to the existing body of literature in the field, providing relevant implications for future research and practice. It is suggested that further investigation be carried out to expand on the knowledge generated from this study, ensuring the advancement of knowledge in the field. In summary, this research has contributed significant findings, and it is hoped that it will be useful for scholars, practitioners, and policymakers alike. The proposal suggests the establishment of an integrated Intelligent Transportation Systems (ITS) operation center within the urban landscape to facilitate the online transmission of traffic flow monitoring data and traffic conditions captured through photo and video surveillance. The system is expected to accurately record and measure vital parameters such as the flow rate, the quantity of cars and public transport vehicles traversing the designated highway, prevailing weather conditions and the overall condition of the roadway. In the event of an adverse occurrence, the operational system ought to issue a timely notification concerning any impediments on the thoroughfare, followed by proposed alternative routes. The adjustment of traffic signal indications should be contingent upon the level of traffic congestion present at proximate intersections. By virtue of the functioning of the aforementioned system, the facilitation of flow coordination in the event of congestion, and the cancellation and assignment of alternative routes, will become achievable.

References:

1. Расулов, М. Х., Машарипов, М. Н., Расулмухамедов, М. М., & Суюнбаев, Ш. М. (2019). Выбор рациональной технологии увязки локомотивов на приграничном пункте пропуска «Ок куприк-железнодорожный». *Universum: технические науки*, (10-1 (67)), 32-36.

2. *Машарипов, Маъсуд, and Bekhzod Sadullayev. АНАЛИЗ ВРЕМЕНИ ОЖИДАНИЯ ЛОКОМОТИВОВ ГРУЗОВЫХ ПОЕЗДОВ В ПУНКТЕ ОБОРОТА. 2019.*

3. RASULOV, M., MASHARIPOV, M., & BOZOROV, R. И. Т. ИННОВАЦИОННЫЙ ТРАНСПОРТ Учредители: Уральский государственный университет путей сообщения. *Российская академия транспорта (РАТ),(2)*, 42-48.

4. Yuldashev, S., & Masharipov, M. N. (2020). RECOVERY OF WORN PARTS BY ELECTRODES. *Journal of Tashkent Institute of Railway Engineers*, *16*(3), 149-153.

5. Расулов, М. Х., Машарипов, М. Н., & Абдуллаев, Ж. Я. (2021). Анализ степени влияния коэффициента съема пассажирских поездов на пропуск грузовых на двухпутных участках. *Инновационный транспорт*, (2), 59-64.

6. Masharipov, M. N. (2020). INCREASING THE STRENGTH OF WORN PARTS WITHCOMPOSITE MATERIALS. *Journal of Tashkent Institute of Railway Engineers*, *16*(2), 168-172.

7. Rasulov, M. X., Suyunbayev, S. M., & Masharipov, M. N. (2020). Research of development prospects of transportation hub in JSC" UMC". *Journal of Tashkent Institute of Railway Engineers*, *16*(3), 71-77.

8. Rasulov, M. X., Masharipov, M. N., Rasulmuhamedov, M. M., & Suyunbaev Sh, M. (2019). The provision terms of train with locomotives and their standing time. *International Journal of Advanced Research in Science, Engineering and Technology*, *6*(9), 10963-10974.

9. Машарипов, М. Н., Расулов, М. Х., Расулмухаммедов, М. М., & Суюнбаев, Ш. М. (2019). Расчет эксплуатируемого парка грузовых локомотивов графоаналитическим методом на языке программирования С. *Интеллектуальные технологии на транспорте*, (1 (17)), 5-12.

10. Gulamov, A., Masharipov, M., & Egamberdiyeva, K. (2022, June). Planning of new transit corridors-New opportunities for the development of transit in Uzbekistan. In *AIP Conference Proceedings* (Vol. 2432, No. 1, p. 030019). AIP Publishing LLC.

11. Rakhmanberdiev, R., Gulamov, A., Masharipov, M., & Umarova, D. (2022, June). The digitalization of business processes of railway transport of the Republic of Uzbekistan. In *AIP Conference Proceedings* (Vol. 2432, No. 1, p. 030111). AIP Publishing LLC.

12. Rasulov, M. X., Rasulmukhamedov, M. M., Suyunbayev, S. M., & Masharipov, M. N. (2020). AUTOMATION OF THE PROCESS OF ATTACHING LOCOMOTIVES TO TRAINS IN CONDITIONS OF A NON-PAIRING GRAPHICS. *Journal of Tashkent Institute of Railway Engineers*, *16*(2), 49-65.

13. Masharipov, M. N., Rasulov, M. K., Rasulmukhammedov, M. M., & Suyunbaev, S. M. (2019). Raschet ekspluatiruemogo parka gruzovykh lokomotivov grafoanaliticheskim metodom na yazyke programmirovaniya C#. *Intellectual Technologies on Transport*, *17*, 5-12.
14. Kuanyshbayev, Z. M., Suyunbayev, S. M., & Masharipov, M. N. (2013). A STUDY OF LOCOMOTIVE COMPONENTS IN INTERMODAL AND UNIMODAL TRANSPORTATION. *SCIENCE AND WORLD*, *49*.
15. Masharipov, M. N., Suyunbaev, S. M., & Rasulmukhamedov, M. M. (2019). ISSUES OF REGULATION OF TRAIN LOCOMOTIVES OF THE RAILWAY SECTION CHUKURSAY-SARYAGASH. *Journal of Tashkent Institute of Railway Engineers*, *15*(3), 144-154.
16. Masharipov, M. N. (2019). THE METHOD OF CALCULATING THE MIDDLE SIMPLE LOCOMOTIVE AND THE TRAIN COMPOSITION IN THE TURNOVER POINT BASED ON THE MODELING IN THE CONDITIONS OF A PAIR TRAFFIC OF TRAINS. *Journal of Tashkent Institute of Railway Engineers*, *15*(3), 173-185.
17. МАШАРИПОВ, М. (2019). РАСЧЕТ ПОТРЕБНОГО ПАРКА МАГИСТРАЛЬНЫХ ЛОКОМОТИВОВ В ГРУЗОВОМ ДВИЖЕНИИ ЖЕЛЕЗНОДОРОЖНОГО УЧАСТКА ЧУКУРСАЙ-САРЫАГАЧ. In *ИНФРАСТРУКТУРА И ЭКСПЛУАТАЦИЯ НАЗЕМНОГО ТРАНСПОРТА* (pp. 190-193).
18. Abdullaev, Z., Rasulov, M., & Masharipov, M. (2021). Features of determining capacity on double-way lines when passing high-speed passenger trains. In *E3S Web of Conferences* (Vol. 264, p. 05002). EDP Sciences.
19. Машарипов, М. Н., & Алламуратова, М. С. К. (2021). УПРАВЛЕНИЕ ЦИФРОВОЙ ЭКОНОМИКОЙ ПО ИННОВАЦИОННЫМ ТЕХНОЛОГИЯМ. *Academic research in educational sciences*, *2*(4), 63-73.
20. Rasulov, M., Masharipov, M., & Ismatullaev, A. (2021). Optimization of the terminal operating mode during the formation of a container block train. In *E3S Web of Conferences* (Vol. 264, p. 05025). EDP Sciences.
21. Masharipov, M. N., Sujunbaev, S. M., Umirzakov, D. D. U., SA'DULLAEV, B. A. U., & ALLAMURATOVA, M. S. K. (2022). Research of the effect of transition of standart weight of trains on locomotive use indicators. *Молодой ученый*, (12 (407)), 23.
22. Numonjonovich, M. M. (2022). ECONOMIC DEVELOPMENT AND THE ROLE OF MASLOW'S HIERARCHY OF NEEDS. *Web of Scientist: International Scientific Research Journal*, *3*(7), 5-10.

23. Marufdjan, R., Masud, M., & Ramazon, B. (2022). RESEARCH ON THE AERODYNAMICS OF HIGH-SPEED TRAINS. *Universum: технические науки*, (6-7 (99)), 30-35.
24. Машарипов, М. Н., Суюнбаев, Ш. М., Умирзақов, Д. Д. Ў., & Нурматжонов, А. А. Ў. (2022). Темир йўл участкасининг юк ташиш қобилияти ва поезд оғирлик меъёрлари ўртасидаги ўзаро боғлиқликни тадқиқ этиш. *Молодой специалист*, *1*(2), 28.
25. Masharipov, M. N. (2019). Improvement of the technology of freight locomotives use at the railway section Chukursay-Sary-Agash. *TashIRE INFORMATION*, *1*.
26. Abdullaeva, M. N., Masharipov, M. N., & Allamuratova, M. S. (2021). DIVERSIFICATION OF PRODUCTION AS A CONDITION FOR THE DEVELOPMENT OF INDUSTRIAL ENTERPRISES. *Экономика и социум*, (2-1 (81)), 5-10.
27. Расулов, М. Х., Машарипов, М. Н., Расулмухамедов, М. М., & Суюнбаев, Ш. М. (2019). Выбор рациональной технологии увязки локомотивов на приграничном пункте пропуска «Ок куприк-железнодорожный». *Universum: технические науки*, (10-1 (67)), 32-36.
28. Rasulov, M. X., Suyunbayev, S. M., & Masharipov, M. N. (2020). RESEARCH OF DEVELOPMENT PROSPECTS OF TRANSPORTATION HUB IN JSC. *UMC"," Journal of Tashkent Institute of Railway Engineers*, *16*(3).
29. Masharipov, M. N. Improvement of the technology of freight locomotives use at the railway section Chukursay-Sary-Agash. TashIRE INFORMATION, № 1.-2019.
30. Numondjonovich, M. M., & Dolimjon o‘g‘li, U. D. (2022). THE ROLE OF EXPORT DEALS IN THE ECONOMY OF UZBEKISTAN. *Web of Scientist: International Scientific Research Journal*, *3*(8), 276-279.
31. Numonjonovich, M. M. S., & Nodirjon o’g’li, N. N. (2021). ENSURING CONDITIONS FOR EFFECTIVE DEVELOPMENT OF INDUSTRY BASED ON PRODUCTION DIVERSIFICATION.
32. RASULOV, M. X., MASHARIPOV, M. N., & BOZOROV, R. S. ИННОВАЦИОННЫЙ ТРАНСПОРТ. *ИННОВАЦИОННЫЙ ТРАНСПОРТ Учредители: Уральский государственный университет путей сообщения, Российская академия транспорта (РАТ)*, (2), 42-48.