Literature Survey

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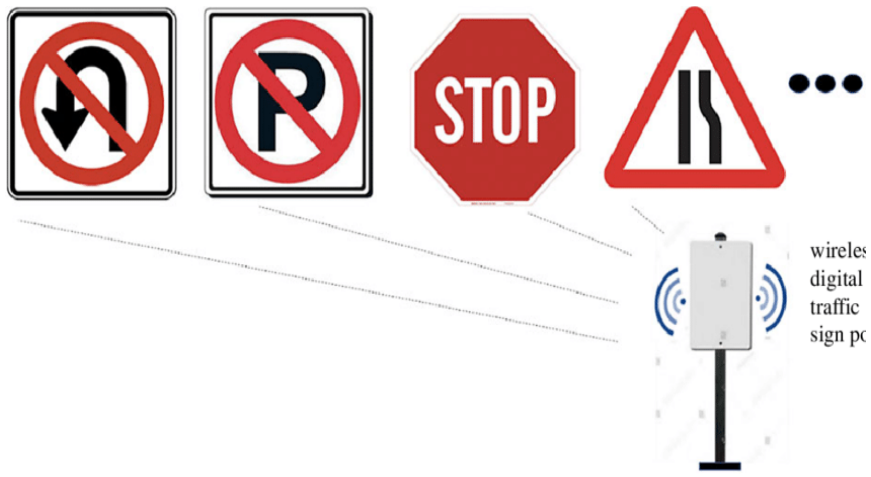
Team ID	PNT2022TMIDI3488
Project Name	Project - Signs with smart connectivity for better road safety

Signs with smart connectivity for better road safety :

Development & Testing of Road Signs Alert System : (Eric M.Masatu & 2022)

Road traffic accident is a major problem worldwide resulting in significant morbidity and mortality. Advanced driver assistance systems are one of the salient features of intelligent systems in transportation. They improve vehicle safety by providing real-time traffic information to the driver. Road signs play an important role in road safety. To be effective, road signs must be visible at a distance that enables drivers to take the necessary actions. However, static road signs are often seen too late for a driver to respond accordingly. In this study, a system for alerting drivers about road signs has been developed and tested using a smart mobile phone. The study was carried out in Tanzania along an 80 km highway stretch from Arusha to Moshi town. The Haversine formula was used to measure and estimate the distance between two pairs of coordinates using the smartphone-based navigation application, Google Map. The application provides a voice alert to a needed action that enhances driver's attention. We propose an alternative method that identifies and modifies a specific class of energy inefficiencies. According to the experimental results, the proposed methodology has the benefits of high accuracy within a user radius of 10 meters, minimum bandwidth, and low-cost application. Furthermore, the system application was secured by limiting access to the application program interface key to avoid unauthorized access to sensitive information.



Agent-Based Approach for Connected Vehicles and Smart Road Signs Collaboration : (Mayssa Hamdani, Nabil Sahli & 2022)

Road traffic is drastically increasing in big cities around the world. In order to enable a flexible management of this traffic, Intelligent Transportation System (ITS) solutions are relying on emergent ubiquitous, mobile, and communication technologies, particularly to intelligently deal with the limited capacities of the existing road infrastructures. While intelligence is left to the autonomous and connected vehicles as well as to the ITS, the road infrastructure has been mostly playing a passive role (as a source of data). Road signage, in particular, are in best cases dynamic but do not play an active role in monitoring traffic and incidents. We propose in this paper to build Smart Road Signs (SRS) that can collaborate with Connected Vehicles in order to monitor traffic and warn drivers about any incident or danger. Our SRSs are meant to operate autonomously in order to detect road traffic problems, share appropriate information with vehicles in the vicinity, and display relevant messages based on the ongoing contextual situation. To meet our goals, we rely on Multi-Agent Systems to design SRSs as proactive components in the ITS landscape. We also rely on agent mobility in order to strengthen the collaboration with the connected vehicles.

References :

[1] X.Lu, Y.Wang, X. Zhou, Z. Zhang, and Z. Ling, “Traffic sign recognition via multi-modal tree-structure embedded multi-task learning,” IEEE Transactions on Intelligent Transportation Systems, vol.18, no. 4, pp.960-972, 2017.

[2] Y. Yang, H. Luo, H. Xu, and F. Wu, “Towards real-time traffic sign detection and classification,” IEEE Transactions on Intelligent Trans portation Systems, vol.17, no. 7,pp. 2022-2031, 2016.

[3] J. Greenhalgh and M. Mirmehdi, “Recognizing text-based traffic signs,” IEEE Transactions on Intelligent Transportation Systems, vol. 16, no. 3, pp.1360-1369, 2015.