Ideation Phase

Literature Survey On The Selected Project & Information Gathering

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Project Name	Project - Signs with smart connectivity for better road safety
Maximum Marks	

INTRODUCTION:

In its Global Status Report on Road Safety – 2015, the World Health Organization (WHO) noted that the worldwide total number of road traffic deaths has plateaued at 1.25 million per year, with tens of millions either injured or disabled [1]. Different initiatives, such as the United Nations' initiative for the 2011-2020 Decade of Action for Road Safety, have led to improvements in road safety policies and enforcement. However, the WHO notes that the progress has been slow and has maintained the call for urgent action to reduce.

Added to the losses in human lives and well-being, considerable monetary losses are incurred in medical expenses, infrastructure repair, and production downtime. While the worldwide figures have plateaued, the Global Status Report does indicate higher road fatalities and injuries in low-income countries. Such disparity, as noted in [3], signals a barring limitation in low-income countries to improve road safety by adopting solutions implemented in high-income countries.

The WHO describes different measures that can be implemented with minimal economic impacts in its "Save LIVES: Road Safety Technical Package" [4]. A cornerstone of these steps is realizing economic systems for "monitoring road safety by strengthening data systems". Meanwhile, a key theme in the package is motivating the adoption of a Safe System approach, which is a holistic approach to road safety that parts from traditional management solutions by emphasizing safety by design.

SIGNS WITH SMART CONNECTIVITY FOR BETTER ROAD SAFETY:

In present Systems the road signs and the speed limits are Static. But the road signs can be changed in some cases. We can consider some cases when there are road diversions due to heavy traffic or due to accidents then we can change the road signs

accordingly if they are digitalized. This project proposes a system that has digital signboards on which the signs can be changed dynamically. If there is rainfall then the roads will be slippery and the speed limit would be decreased. There is a web app through which you can enter the data on road diversions, accident-prone areas, and information sign boards can be entered through the web app. This data is retrieved and displayed on the signboards accordingly.

A central emphasis is given to speed in the SS approach as it is the strongest and most fundamental variable in the outcome of fatality. The fragility of the human body makes it unlikely to survive an uncushioned impact at a speed of more than 30 km/h, with lower speeds resulting in either death or serious injury [3, 4]. The objective of the SS approach is that the three model elements should be designed and monitored to proactively prevent deadly speeds from happening and allow for a reduced emergency response time in the event of an accident.

REPORTS BASED ON SIGNS WITH SMART CONNECTIVITY FOR BETTER ROAD SAFETY

1) F. Wegman, "The future of road safety: A worldwide perspective," IATSS Research, vol. 40, no. 2, pp. 66–71, 2017.

Estimates by the World Health Organization suggest that every year, road crashes kill 1.25 million people—nearly 3400 road fatalities per day—and injure up to 50 million. Traffic injuries are not equally spread over the world, however; some countries are hit harder than others, and the chance of being killed in a road crash depends on where one lives. Almost 90% of all traffic casualties occur in low- and middle-income countries (LMIC). Globally, the number of fatalities per 100,000 population (mortality rate) ranges from less than 3 to almost 40. The rate is less than 9 in high-income countries (HIC) but averages around 20 in LMIC, with the African region demonstrating the highest rate (26.6). While road safety trends have been positive in HIC over the last few decades, trends in LMIC are not telling a positive story: road fatalities are expected to increase to almost 2 million road fatalities per year by 2020.

2) W. E. Marshall, "Understanding international road safety disparities: Why is Australia so much safer than the United States?" Accident Analysis & Prevention, vol. 111, pp. 251–265, 2018.

Despite similarities to the US in terms of transportation, land use, and culture, Australia kills 5.3 people per 100,000 population on the roads each year, as compared to the US rate of 12.4. Similar trends hold when accounting for distance driven and the number of registered cars. This paper seeks to understand what is behind the road safety disparities between these two countries.

The results suggest that several interrelated factors seem to play a role in better road safety outcomes in Australia as compared to the US. This includes Australia's strategies related to seat belt usage and impaired driving as well as their efforts to help curb vehicle speeds and reduce exposure. Design-related differences include a much greater reliance on roundabouts and narrower street cross-sections as well as guidelines that encourage self-enforcing roads. Policy-related differences include stronger and more extensive enforcement programs, restrictive licensing programs, and higher driving costs.

Combined with a more urban population and multimodal infrastructure, Australia tends to discourage driving mileage and exposure while encouraging safer modes of transportation such as transit, at least more so than in most of the US. Australia also enacted its version of Vision Zero – called the Safe System Approach – more than a decade before similar policies began cropping up in US cities. While it is difficult to attribute recent road safety successes to any specific policy, Australia continues to expand its lead on the US in terms of safety outcomes and is a road safety example worthy of consideration.

3) M. Yamada, K. Ueda, I. Horiba, and N. Sugie, "Discrimination of the Road Condition Toward Understanding of Vehicle Driving Environments," IEEE Transactions on Intelligent Transportation Systems, vol. 2, no. 1, pp. 26–31, 2001.

The detection of vehicle driving environments is necessary to secure transport facilities safe from accidents and to keep the performance smooth. The road condition is one of the most important factors in the detection of vehicle driving environments. Conventional discrimination methods for road conditions involved the use of optical or ultrasonic sensors. However, since these sensors can only provide spot information, detected results do not always reflect the spacious condition. To deal with this problem, a new algorithm that employs image analysis technology for the discrimination of road conditions is proposed in this paper. In this algorithm, for discrimination of road

conditions, we focused on features related to water and snow on the road, and we extracted these features by image analysis. Features related to water were extracted by the ratio of horizontal polarization image intensity to vertical polarization image intensity for each pixel. Features related to snow were extracted by texture analysis using the co-occurrence matrix. We employ a multivariate analysis to discriminate five kinds of road conditions: "Dry," "Wet," "Slushy," "Icy" and "Snowy," based on these features extracted from the road images as well as temperature. Furthermore, we conducted field tests to verify the accuracy of this algorithm and obtained a favorable discrimination accuracy rate of 92.3% on average.

CONCLUSION:

The above listed are proposed solutions and reports of various researchers expressed about the signs with smart connectivity for better road safety.