Development of Automatic Speed Sensing of Vehicle Using Arduino

Nandeesh A Halabhavi[1], Charan Guru Dayal T[2], Venkanna A[3], VVamsi P[4]

[1, 2, 3, 4] JAIN University

Abstract- *We as a whole realize that over speed is the significant reason for street mishaps. In this bustling life plan, individuals generally really like to drive at very speed instead of lowing rate to come to their which would be utilized as a speed limit authorization framework. Rash driving is the cause of many accidents in India (45.12 per lakh in 2011). The existing systems either require human's intervention. There are a lot of areas to cover and it is not physically possible to cover all of them. This problem is even more enhanced at night when the authorities are off duty. Visibility is also lower which decreases the ability to identify the speed of a vehicle.*

Keywords- Speed, Framework, Visibility

I. INTRODUCTION

A framework which assists with restricting the speed of the vehicles and the proprietor would be rebuffed under the law due to over speed and this is the best technique for making individuals to drive at typical assigned rates. Ina few spots, traffic cops are there to screen to legitimate working of traffic on streets[1-2] and at certain spots, traffic places RADAR framework is utilized and this is an innovation which depends on the Doppler Effect and with only one trigger it can decides the speed of the vehicles[3-6]. Each framework regardless of whether it is a RADAR or some other it physically requires a human to take for watching the vehicles passing by and to report in the event that any vehicle violates the law or over speeds [7-10]. Each framework involves progressions in innovation to focus on the robotization over human took care of machines [11-14]. In this way, the traffic checking framework ought to likewise be made as programmed which is conceivable in numerous ways [15-18]. This paper is a thought of one of such frame work. The venture is created by keeping in view all the impediments referenced above and is named as Speed Check and over speed finder [19-20]. The central idea surrounding this system is to identify the speed of a vehicle through the use of video processing[21]. The system will then grab the license plate from the frame, and using image processing extract the license number and send it to a web server [22-23]. The web server will then look up other details connected to the license plate and make certain decisions on whether to send a ticket or not to the registered citizen.

II. COMPONENTS USED

- Transmitter
- Power Supply
- Resistors
- ARDUINO UNO Board
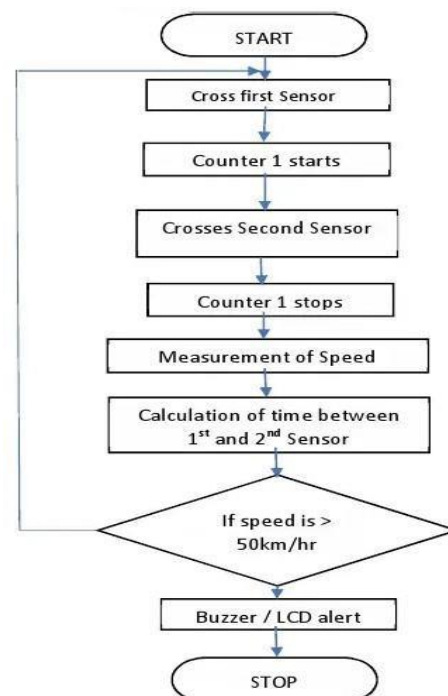- LCD Display
- IR Sensors

III. FLOW CHART

Fig 1: Process Flow Chart

The figure 1 show the process flow of the system which is used for speed sensing of system.

IV. MARKET REVIEW

The systems in use at the moment necessitate manual intervention from authority. Highway enforcement personnel keep an eye out for speeders or establish bases nearby. Devices that measure speed using the Doppler Effect or other

phenomena may be used. These gadgets typically sound a buzzer or flash lights to alert drivers of a fast car. Using yet another technique,typically by timing the car in deserted tourist spots or hilly areas. This approach compares the vehicle's in-time and out-of-time measurements.

Drawbacks of the existing system:

- We need traffic authorities to cover the large area and give salary to those traffic authorities. It is not as cost-effective. The area covered to cost ratio is very low.
- At night, visibility is much lower, which makes it harder to check if a vehicle is speeding. It is difficult to read the license plate for humans as well.
- Systems such as a radar speed detection system do not work well beyond a certain speed range. □Systems like radar take time to lock onto targets.
- Handheld RADAR systems tend to show wrong values. Extremely sensitive to even the smallest stimuli.

An Arduino based system brings the following benefits:

- Cheap and easy to setup
- Compact design, can be added to relatively narrow spaces.
- Can be modified to count number of over speeding vehicles, thereby identifying problem areas
- If connected to the internet (with the help of a GSM tool) can provide live updates and reduce delays in fines and penalties
- Completely automated, no human intervention required
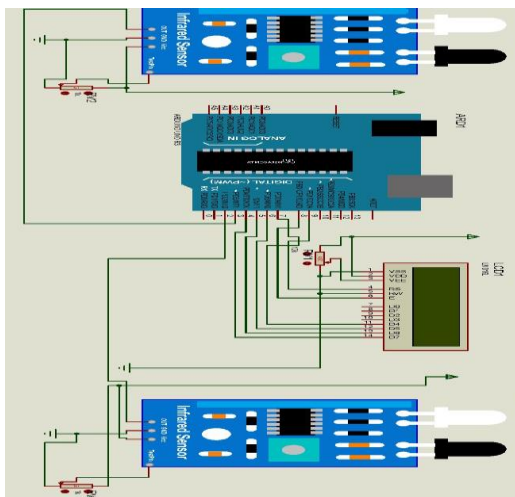
V. CIRCUIT DIAGRAM

Fig 2: Circuit Diagram of system

The Arduino-based automobile speed detector project as shown in figure 2 operates in a fairly straightforward manner. The IR Sensor inputs are continually read by Arduino. When an automobile passes in front of the setup and hits the first sensor, Arduino alerts and records the time the car departs the first IR Sensor.When the automobile approaches the second IR Sensor, another time stamp is recorded. The Arduino Millis() method was used to capture the time stamps. The velocity is then calculated by Arduino using the distance in metres between the two IR Sensors and shown in kilometres per hour on the 162 LCD Display.

VI. CONCLUSION

In this post, we can simply determine the speed of vehicles/humans using Arduino and IR sensors, and overspeeding vehicles/humans will be informed. This research focuses on using it as a sport check to keep track of speed near restricted locations. The system collects vehicle and human data. By showing speed (moving objects) on an LCD monitor, and sounding a buzzer if excessive speed is detected. The detecting system continually monitors the vehicle's speed. It lessens traffic department obstacles and makes it easier to manage reckless driving and high-speed vehicles on highways.As a consequence, the police can provide more convenient and accurate service while sitting in the control room. This method might be improved in the future by including a camera that takes the picture of the car's licence plate and sends it to the proper traffic authorities or vehicle owner. Furthermore, with the assistance of a gsm module, the system may be linked to the internet for realtime updates to the appropriate authorities, hence reducing delays in the penal system.

REFERENCES

[1] Vishal Pande, Malhar Malhar Mohite, Supriya Mhatre, Siddhesh Desai, Anjali kumari, "Autonomous Speed Control of Over Speeding Vechicles Using Radio Frequency", International Journal of advanced Research in Electronics, Electronics and Instrumentation Engineering Vol.4,Issue 4, April 2015.

[2] Monika Jain, Praveen Kumar, Priya Singh, Chhavi Narayan Arora, Ankita Sharma, International Journal of Computer Science and Mobile Computing a Monthly Journal of Computer Science and Information Technology, Vol. 4, Issue. 4, April 2015. "A system Detection of over Speeding Vehicles on Highways".

[3] Design And Implementation of Pc Based Over Speed Violation Management For Vechicles On Highway" by Ni Hlain, Zaw Min Htun, Hla Myo Tun International Journal Of Scientific & Technology Research Volume 4, Issue 07, July 2015 .

[4] M S Patil, S P Deshmukh , "Design and Development Aspects of Flexure Mechanism for High Precision Application", AIP Conference Proceedings 1943, 020023 (2018); doi: 10.1063/1.5029599,(2018)

[5] Pratik M. Waghmare, "A REVIEW PAPER ON FLEXURE" International Journal for Science and Advance Research In Technology, 3(10) 2017.

[6] Deshmukh Suhas P, "XY Scanning Mechanism: A Dynamic Approach", International Journal of Mechanical Engineering and Robotics Research, Vol. 3, No. 4, October 2014, pp.140-154.

[7] Deore, Om Bipin, "Design and Analysis of Complaint Mechanism using FEA." development 7.10 (2020).

[8] Dr. M S Patil and Dr. S P Deshmukh, "Experimental Investigation of High Precision XY Mechanism", International Journal of Mechanical Engineering and Technology,9(5), 2018, pp.43–50.

[9] S B Sollapur, "Evaluation of Stiffness and Parametric Modeling of XY Flexure Mechanism for Precision Applications", *Journal of Modeling and Simulation of Materials*, vol. 1, no. 1, pp. 8-15, May 2018. doi: 10.21467/jmsm.1.1.8-15

[10] Pratik M.Waghmare, , "Design of Compliant Mechanism And PID controller", International Engineering Research Journal Page No 416-420, SECOND MECHPGCON 2016.

[11] M S Patil, S P Deshmukh, "Advancement and Experimental Investigation of Voice Coil Actuator utilizing Flexural Bearing", *Journal of Mechatronics and Automation, STM Journals, Vol 5,Issue 2, 2018. pp. 40-45*

[12] Shrishail B., et al. "Design and Experimental Testing of XY Flexure Mechanism." Journal of Engineering Science and Technology 16.2 (2021): 1416-1425.

[13] Pratik Waghmare, "Design and Experimental Investigation of XY Compliant Mechanism for Precision Applications", ECS Transactions, 2022/4/24, Volume 107 Issue 1 Pages 4967

[14] Prasanna Raut et. Al, "Design and Testing of Flexural Kinematic Mechanism using Large Workspace", Eur. Chem. Bull. 2022, 11(Issue 12), 213-221, DOI: 10.48047/ecb/2022.11.12.025

[15] Devkant Bhaviskar et.al, "Design of XY Planer Mechanism using DFM for Parallel-Kinematic Micro Positioning XY Stage",Stage Eur. Chem. Bull. 2022,11. (Issue 11), 222-228 DOI: 10.48047/ecb/2022.11.11.25

[16] Saravanan, D., et al. "Tribological properties of filler and green filler reinforced polymer composites." Materials Today: Proceedings 50 (2022):2065-2072.*https://doi.org/10.1016/j.matpr.2021.09.414*

[17] Shraddha Gunjawate, "Structural Analysis and Topology Optimization of Leaf Spring Bracket", *International Journal of Engineering Research & Technology (IJERT) Vol. 9 Issue 07, July-2020. pp. 1448-1494*

[18] Toradmal, Kuldeep P., Pratik M. Waghmare, and Shrishail B. Sollapur. "Three-point bending analysis of honeycomb sandwich panels: experimental approach."

International Journal of Engineering and Techniques 3.5 (2017).

[19] M. S. Patil, and S. P. Deshmukh. "Design and development aspects of flexure mechanism for high precision application." AIP Conference Proceedings. Vol. 1943. No. 1. AIP Publishing, 2018.

[20] Waghmare, Pratik M., Pankaj G. Bedmutha, "Investigation of effect of hybridization and layering patterns on mechanical properties of banana and kenaf fibers reinforced epoxy biocomposite." Materials Today: Proceedings 46 (2021): 3220-3224.

[21] Shinde, Tarang, et al. "Fatigue analysis of alloy wheel using cornering fatigue test and its weight optimization." Materials Today: Proceedings 62 (2022): 1470-1474.

[22] M. S. Patil, and S. P. Deshmukh. "Position Estimator Algorithm Implementation on Precision Applications." Materials Today: Proceedings 24 (2020): 333-342.

[23] Shrishail B., et al. "Design And Experimental Testing Of XY Flexure Mechanism." Journal of Engineering Science and Technology 16.2 (2021): 1416-1425.