Smarter stop signs:
New tech to improve intersections

by Andy Greaser
www.RevZilla.com/common-thread/

Engineers at the University of Texas at San Antonio (UTSA) recently showed a project they've been working on to reduce collisions at intersections using smarter stop signs.

Their design places a flashing light over existing signs, triggered by a multi-pixel passive infrared sensor. The sensor picks up an approaching vehicle's thermal signature, classifies it, and flashes the light to alert the motorist that a stop sign is coming up. The team hopes

Flashing lights over existing stop signs draw a driver's eye. Screenshot from UTSA video.

Next Breakfast/Brunch

Saturday, May 4

WHERE:
Jake's at the Lake
109 S Shore Road
Cowichan Lake, BC

Meeting Place:
8:45 am at Tim Hortons
Millstream below Costco
Breakfast at 11:00 am at
the restaurant

Uncontrolled Intersection 41 times more risk

the added visibility will reduce failure-to-stop accidents, especially in rural areas where signs can be hard to see. The solar-powered devices mount on top of existing signposts, and cost between $60 and $100. That's a huge savings over conventional vehicle detection systems, which could cost thousands to install.

Zachary Balcar, a master's student in UTSA's Department of Electrical and Computer Engineering, says the system "distinguishes the vehicle's direction of travel, estimates the velocity of its thermal signature and determines the classification of the vehicle." The flashing light should give road users a better chance of seeing the sign and coming to a stop safely.

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A couple years ago, Lance wrote about the Motorcycle Crash Causation Study (MCCS), and that report alone makes a compelling case for improving signals and signs at intersections. The MCCS found that 66.7 percent of the crashes studied occurred at intersections. The Virginia Tech study we wrote about came to similarly grim findings.

"An uncontrolled intersection presents nearly 41 times the risk of no intersection. A parking lot or driveway intersection is more than eight times as risky and an intersection with a signal is almost three times as risky."

Could technology make intersections safer? Vehicle-detection tech exists, but it's tough (and expensive) to implement on rural roads without access to the grid. And that's a problem, because the UTSA found that rural roads in Texas move just 19 percent of the traffic but account for more than

Rural roads 19% of traffic but half of fatalities

half of all road fatalities.

In testing, the smart stop sign had a vehicle detection accuracy rate of 90 percent, with a classification accuracy rate of 72 percent. That's actually better accuracy than most magnetic loop inductors, video image processors and microwave radar systems, and at a fraction of the cost. To learn more, I interviewed Dr. Sara Ahmed about the smart stop sign project.

Common Tread: What's a multi-pixel passive infrared sensor?

Dr. Sara Ahmed: A multi-pixel passive infrared sensor is a type of sensor that observes precise measurements of temperature for different locations of the sensor's field of view. We use this type of sensor to observe changes in temperature to detect the vehicles.

CT: Can the sensors detect a motorcycle? Riders sometimes struggle to get traffic lights to react.

SA: Yes, our system does detect motorcycles and in our testing we had a high detection accuracy for motorcycles.

CT: Because the thermal sensor doesn't capture images like a traditional camera, these devices preserve the privacy of motorists more than, say, a traffic cam?

SA: Yes, one of the reasons the team chose to use the passive infrared sensor is because it allows the motorist to remain completely anonymous.

CT: What was a big challenge of this project?

SA: One of the biggest challenges of the project was being able to detect vehicles in warmer environment with temperatures of 95 degrees Fahrenheit and above. To account for the different temperature environments, we had to develop

Flashing lights add benefit to motorcyclists

specialized algorithms that read the temperature and then automatically adjust to it.

CT: Has your team considered the indirect benefits to vulnerable road users, like motorcyclists, bicyclists, and pedestrians?

SA: At first the team didn't consider the indirect benefits to bicyclists and pedestrians, but after the team viewed how the system increased the safety of the intersection, the team began to consider the indirect benefits. We now have a new project that specifically studies how the system can be improved to increase the safety for bicyclists and pedestrians.

CT: Any plans underway to install these on public roads?

SA: Yes, there are currently plans to further develop the system and test them on public roads. We are in contact with municipalities that are interested in testing our system. We are also in contact with different vendors that are interested in adopting our technology.

It's good to see cost-effective innovations that improve road safety, such as the work by Dr. Ahmed and team. As motorcyclists, we're constantly working to stay aware of our surroundings, and this kind of smart stop sign can not only reduce the changes of us missing a stop sign in the dark, but also could reduce the odds of a driver blowing through a stop sign and hitting us. We'll take all the help we can get.

Club 2019 Event Schedule

Date	Event	Location
Saturday, May 4, 2019	Monthly Gathering	Jake's at the Lake, Cowichan Lake
Sunday, May 19, 2019	Monthly Ride	Rampant Lion, Maple Bay
Sunday, May 27, 2019	Vancouver Island Ride to Live	The Local, 1205 Wharf Street
Sunday, June 2, 2019	Monthly Gathering	Shady Rest Pub, Qualicum Beach
June 15-16, 2019	Up Island Event	TBD - Need a Volunteer
Saturday, July 6, 2019	Monthly Gathering	Saltspring Island
Sunday, July 21, 2019	Ride to Brunch	Shirley's
Saturday, August 3, 2019	Monthly Gathering	Unsworth Vineyard, Mill Bay
TBD August, 2019	Hotsprings Rally	Nakusp, BC
Saturday, August 25, 2019	Club BBQ	Chez Randy
Sunday, September 1, 2019	Monthly Gathering	Timberland Pub, Ladysmith
Saturday, September 21, 2019	Monthly Ride	Port Renrew / Cowichan Loop
Sunday, October 6, 2019	Monthly Gathering	The Crooked Goose
Saturday, October 19, 2019	Annual Meeting	TBD
Saturday, November 2, 2019	Monthly Gathering	Spitfire Bar & Grill
Sunday, December 1, 2019	Monthly Gathering	1550's Pub