Wireless Pedestrian Detection Technology

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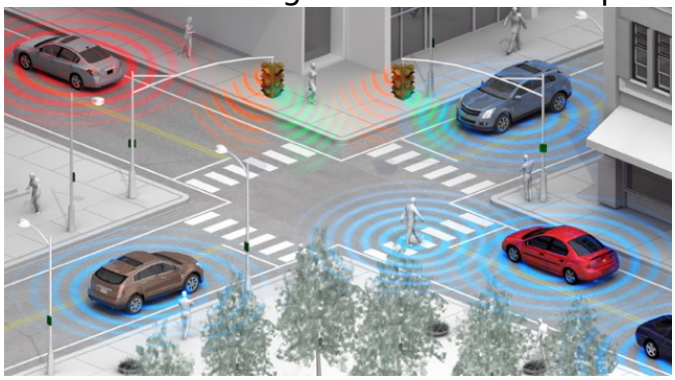
We've all been there – distracted while driving. Unfortunately for some, it can result in a horrible accident. Hitting another car, a tree, or even a pedestrian. General Motors is making moves to prevent these accidents, and I must admit – the technology is pretty cool (and you've probably heard of it).

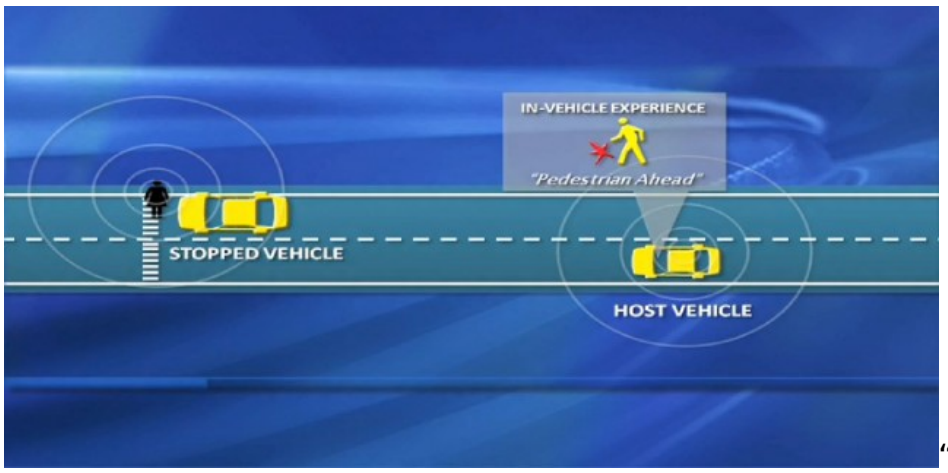
A driver assistant feature that is capable of detecting pedestrians, on foot or on bike, on congested streets or in poor visibility conditions before the driver even sees them. The technology behind this innovative idea is Wi-Fi Direct. This is the peer-to-peer wireless standard that allows devices to communicate directly with each other rather than through a shared access point (like a cell tower).



If that isn't cool enough, GM researchers [1] have uncovered even more. Wi-Fi Direct can actually be integrated with other sensor-based object detection and driver alert systems already available on production vehicles (and it can play your favorite music – keep reading for details). This will help detect pedestrians and bicyclists carrying smartphones equipped with Wi-Fi Direct.

They're looking into a developing a free app for Wi-Fi Direct-capable smartphones that can be downloaded by regular road users. A "bike messenger" or "construction worker" will help Wi-Fi Direct-equipped vehicles identify them. Devices in the pockets of pedestrians will alert your connect car, which will then alert you to begin hitting the brakes.

This new feature, wireless pedestrian detection, is part of GM's continuous development of vehicle-to-infrastructure (V2I) and vehicle-to-vehicle (V2V) communication systems. V2V is an advanced concept (at least a few years out) where cars form massive mesh networks share details with each other. If there's an accident up ahead, V2V can be used to alert every car (and driver) for miles around. If a car brakes quickly in front of you, V2V can prime your brakes, or brake automatically. The hope is that these advanced systems can provide advanced warning about hazards, to reduce the number of accidents.



"This new wireless capability could warn drivers about pedestrians who might be stepping into the roadway from behind a parked vehicle, or bicyclists who are riding in the car's blind spot," said Nady Boules, GM Global R&D director of the Electrical and Control Systems Research Lab. "Wi-Fi Direct has the potential to become an integral part of the comprehensive driver assistance systems we offer on many of our Chevrolet, Cadillac, Buick and GMC vehicles."

The use of Wi-Fi Direct, eradicating the transitional step required to reach a cell phone tower, allows devices to connect in one split second. The use of other wireless systems would not be as effective, as they tend to take seven or eight seconds to attain location information and connect.

"Wi-Fi Direct's fast connections offer a distinct advantage in vehicle applications," said Donald Grimm, GM Global R&D senior researcher of perception and vehicle control systems. "The quicker a vehicle can detect other Wi-Fi Direct users, the greater the potential for collision avoidance."

In 2012, 4,280 pedestrians and 618 bicyclists lost their lives in collisions with motor vehicles, According to the National Highway Traffic Safety Administration. Both totals were down by as much as 25 percent since 1995, consistent with overall traffic fatalities. Thanks to GM, these numbers have potential to drastically decrease with the use of this new technology.

According to the Wi-Fi Alliance, Wi-Fi Direct devices can reach each other at a maximum distance of 656 feet or more than two football fields away. The potential for this technology goes beyond reducing the number of traffic fatalities; it can also be used to transfer files between devices in the home with your Wi-Fi Direct-equipped vehicle infotainment system, including music and digital address books. Yes, this means you can jam out to your favorite music without any extra devices connected.

Wi-Fi Direct is only one of many important technologies that may change our society, for the better. Self-aware connected cars could not only be a huge convenience, but it could also potentially save lives. And who doesn't want to save lives?!

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