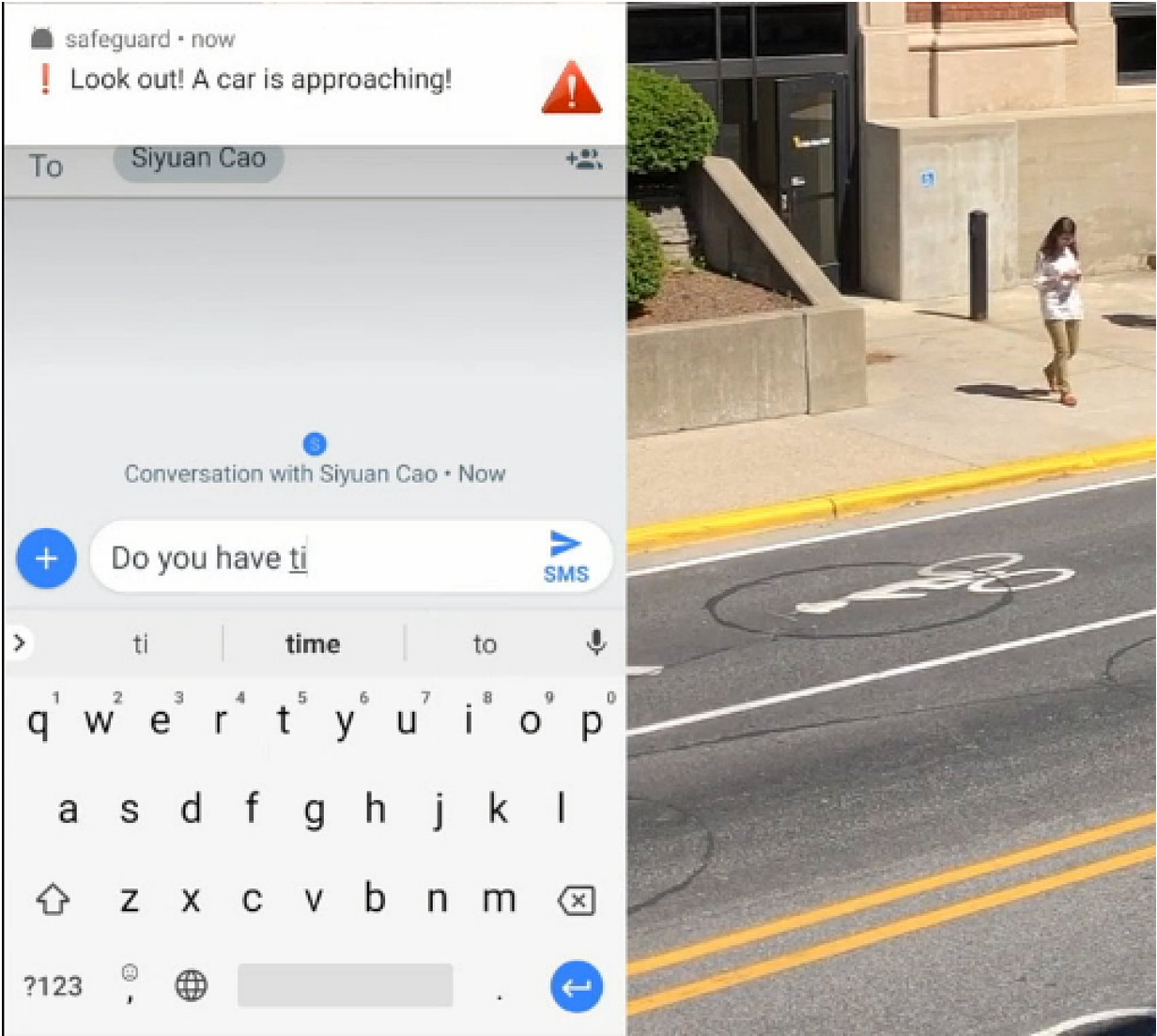


Saving pedestrian lives by using public cameras to communicate with smartphones

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Purdue University researchers developed a system for surveillance or other cameras in public to send an alert directly to a smartphone. Credit: Purdue

University

Purdue University researchers are looking at a new way to alert walkers distracted while using their smartphones about oncoming vehicles as a method to lower pedestrian deaths, which have hit a three-decade high in the United States.

The Governors Highway Safety Association reports that 5,984 pedestrians were killed in 2017, a 33-year high, while other kinds of [traffic deaths](#) have decreased.

"This is a growing problem in the United States with more pedestrians and drivers distracted by their phones," said He Wang, an assistant professor in the Purdue Department of Computer Science, who created the technology along with his Ph.D. student, Siyuan Cao. "Now, we have created an innovative system to use those same phones to help save lives."

The Purdue team developed a system called PHADE, which allows surveillance or other cameras in public to send an alert directly to a smartphone.

The technology will be presented during the [UbiComp conference](#) in October in Singapore.

Although traditional data transmission protocols need to first learn the destination's IP or MAC address, this system uses motion patterns as the address [code](#) for communication. The smartphones then locally make their own decisions on whether to accept a message.

"This system basically allows [surveillance cameras](#) to talk to the public

through their individual phones," Cao said. "The camera can send an almost instant alert to a pedestrian that a car is coming."

The pedestrian would receive a message to their phone that reads: Danger! Oncoming vehicle.

The PHADE system works using a server to receive video streams from cameras to track people. The camera builds a packet by linking a message to the address code and broadcasts the packet.

Upon receiving the packet, a mobile device of each of the targets uses sensors to extract its owner's behavior and follow the same transformation to derive a second address code. If the second address code matches with the address code in the message, the mobile device automatically delivers the message to its owner.

"Our technology serves as a bridge to connect cameras and people," Wang said. "Surveillance cameras are widely deployed today and human and [artificial intelligence systems](#) can retrieve numerous bits of information from the video feeds of these cameras. Our innovation turns that information into life-saving applications."

Cao said surveillance [camera](#) and security companies would also be able to integrate the technology into their products directly as a key feature. The technology also can be used in shopping malls, museums and other locations to send personalized messages to people without compromising their privacy.

Provided by Purdue University

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