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CMU-developed smart headlights help drivers cut down on glare

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More than half of motor vehicle crashes occur at night, despite the fact that there is less traffic on the road. One obvious reason is that it's simply more difficult for drivers to see at night.

While the headlight has been around for more than 130 years, a [new smart headlight](#) developed by researchers at **Carnegie Mellon University's** Robotics Institute could have the potential to curb late night accidents by allowing drivers to take full advantage of their high beams without fear of blinding other motorists and reducing the glare that can occur when driving in snow or rain at night.

The programmable headlights work by sensing and tracking virtually any number of oncoming drivers and blacking out only the small parts of the headlight beam that would shine into their eyes. In the case of inclement weather, the headlight improves driver vision by tracking individual flakes and drops in the immediate vicinity of the car and blocking the narrow slivers of headlight beam that would otherwise illuminate the precipitation and reflect back into the driver's eyes.

[Srinivasa Narasimhan](#), associate professor of robotics, said with the system, headlights can actually be made brighter than they are today without causing distractions for other drivers on the road. The system uses a DLP projector instead of a standard headlight or cluster of LEDs which allows the researchers to divide the light into a million tiny beams that can each be independently controlled by an onboard computer.

A camera is used to sense the oncoming cars, precipitation and other objects of interest and the light beams can be adjusted accordingly. Researchers said the changes in overall illumination are minor and are generally not noticeable by the driver.

[Robert Tamburo](#), the project's lead engineer, will present findings from tests that have been conducted in Pittsburgh Sept. 10 at the European Conference on Computer Vision.

The research was supported by Ford Motor Co., the Intel Science and Technology Center for Embedded Computing, the Office of Naval Research and the National Science Foundation. It is part of the Technologies for Safe and Efficient Transportation Center, a **U.S. Department of Transportation** University Transportation Center at Carnegie Mellon.

Justine Coyne covers manufacturing and higher education.