

AI system makes finding potholes cheaper and easier

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Governments may soon be able to use artificial intelligence (AI) to easily and cheaply detect problems with roads, bridges and buildings.

A new AI software system developed by researchers at the University of Waterloo automatically analyzes photographs taken by vehicle-mounted cameras to flag potholes, cracks and other defects.

"If governments have that information, they can better plan when to repair a particular road and do it at a lower cost," said John Zelek, an engineering professor at Waterloo. "Essentially, it could mean lower taxes for residents."

Governments around the world currently take two basic approaches to monitoring the condition of roads, the initial focus of the research.

In many small jurisdictions, workers simply drive around, visually inspect roads and take notes. Others use trucks fitted with expensive cameras to record images of pavement for manual assessment by teams of analysts.

According to Zelek, the automated AI system now being refined at Waterloo would cut assessment costs, achieve at least comparable accuracy, lead to more timely repairs because of more frequent monitoring and produce uniform results.

"It is more consistent analysis because you're not introducing the biases of different human beings who look at the data differently," he said.

The project began using free online images of roads from Google Street View. Researchers have since also applied the AI software to images from other sources, including a company with a partially automated system to detect pavement defects.

Zelek, who is collaborating with Ph.D. student David Chacra, said small jurisdictions could use the AI system to analyze video taken by cellphone cameras mounted in vehicles as workers go about their usual

business.

Data from the automated assessments could then be superimposed on street maps to create a tool enabling officials to plan and prioritize repairs.

In addition to refining their [road](#) assessment technology, researchers are exploring use of the AI software on images recorded by drones of bridges, buildings and other infrastructure. Another potential application would involve monitoring the progress on construction projects.

"If the parts of a new building aren't coming together properly, it would obviously be very beneficial to flag problems before the next 30 storeys have been put up," said Zelek.

The latest in a series of papers on the research will be presented at the 26th European Signal Processing Conference in Rome, Italy in September.

Provided by University of Waterloo

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