New tool uses AI to target smarter building repairs with limited funds

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Researchers have developed a tool to help governments and other organizations with limited budgets spend money on building repairs more wisely.

The new tool uses [artificial intelligence](#) (AI) and text mining techniques to analyze written inspection reports and determine which work is most urgently needed.

"Those assessments are now largely subjective, the opinions of people based on experience and training," said Kareem Mostafa, an engineering Ph.D. student at the University of Waterloo who led the project. "We're using actual data on buildings to make spending decisions more objective."

Researchers looked at inspection reports on the roofs of 400 schools managed by the Toronto District School Board. A [computer model](#) was developed to search the one- to two-page reports for about 30 keywords, including words such as 'damage' and 'leaks.'

By analyzing the frequency of the keywords, plus factors including the age of roofs, the AI software divided the schools into four categories based on the urgency of repair or replacement. The goal was to give the [school](#) board an objective way to target its limited funds, speeding up the assessment process and helping it spend money where it makes the most sense.

"We're playing Moneyball with [building](#) assets," Mostafa said. "By using data on buildings instead of opinions, our model also takes potential political headaches out of the process."

Although the software was developed to assess the need for roof repairs, it can be tweaked to help prioritize other kinds of work for organizations with budget limitations and many buildings to maintain.

Mostafa is also working to incorporate other kinds of data, including AI analysis of photographs, into the assessment model.

Tarek Hegazy, a professor of civil and [environmental engineering](#) at Waterloo, and Ahmed Attalla, a project manager with the school board, collaborated on the study.

Provided by University of Waterloo