Autonomous search agents could support researchers

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Researchers could soon enlist help from digital assistants to review vast swathes of literature, according to a new report on artificial intelligence.

In tests run by academics at the Universities of Strathclyde and Glasgow, simulated search agents went head-to-head with humans in a computer search challenge - and won.

They were found to be considerably more effective than human participants, and, while they differed significantly in behaviour, they could be configured to offer a credible and realistic simulation of a human researcher.

Dr Leif Azzopardi, a Senior Lecturer in Strathclyde's Department of Computer and Information Sciences and a partner in the research, said: "There's currently a great deal of discussion about artificial intelligence and the role it could play in the future.

"An autonomous search agent could be useful for researchers reviewing vast amounts of literature in subjects such as law and medicine. In this type of information-intensive review, it could read through and assess information while the researcher is working on other things, then suggest other sources of information that would be relevant.

"Previously the simulated users we created were unrealistic and lacking in agency. Their decisions were made stochastically - by the 'roll of dice' - rather than based on the actual information found and the underlying

need for information.

"The model we have developed takes account of what the autonomous agents knows, has done and has seen, along with what it considers to be relevant. It is constantly evolving.

David Maxwell, a PhD Student from the University of Glasgow's School of Computing Science, said: "We conducted a series of experiments where 48 people were given two search tasks to complete; we then set the autonomous agents the same search tasks, under the same conditions, and they significantly outperformed the human searchers.

"Our findings are very promising and show that it is possible to create realistic simulations of how humans search. Now we can look to apply this technology to augment the search capabilities of humans to help them process more information and find more relevant material."

The initial findings provide the infrastructure and models that could help automate the evaluation of search engines and lead to the development of collaborative search agents, which help researchers and information workers process large amounts of text.

The research is to be presented at the international Conference in Information & Knowledge Management in Indianapolis in October 2016. The theme of the conference is Frontiers and Applications of Big Data.

Provided by University of Strathclyde, Glasgow