OFFICIAL ABSTRACT and CERTIFICATION

Two-Step Information Retrieval for Automatic Question Answering

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Automatic question-answering through machine learning algorithms has numerous applications in business, public health, and other real-world problems where skilled work has the potential to be supplemented or replaced with AI natural language understanding. This investigation examined the AI2 Reasoning Challenge (ARC) question dataset, which provides multiple-choice questions to compare standard information retrieval methods that use text span with a more sophisticated two-step information retrieval protocol. The hypothesis was that this method could use contextual information to more accurately answer questions.

The results showed that the experimental group, using a two-step method, had a 36.0% accuracy rate compared to 33.1% for the control group. These results were statistically significant ($p = 0.01$) and suggest that the contextual information were more productive than the more straightforward direct text similarity metrics. Future research will focus on how this effect varies by difficulty, question length, and other variables.

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