



DISRUPTIVE TECHNOLOGY OFFICE

ADVANCED QUESTION ANSWERING FOR INTELLIGENCE (AQUAINT) PROGRAM

Solomon: A Next-Generation Q&A System

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Summary

Current QA technology aims at the very early, pre-reasoning stages of IA where the questions to be answered are straightforward; so-called “factoid” questions. But later in the process, inevitably, the questions an analyst has will be deep and complex, and the analysis and arguments given in support of a recommendation will by definition be deep, complex, and knowledge-based. At this point, the analyst’s questions will require knowledge-based technology, if these questions are to be answered by systems that assist him/her.

We are constructing a *proof-of-concept* of Solomon: a radically new, knowledge-based QA system capable of producing rational, justified answers for conceptual, hypothetical, and even open-ended questions. Solomon transcends the limitations of existing systems by approaching real conversation with real humans, and in general points the way to a time when sophisticated QA systems can collaborate as bona fide intelligent assistants to human analysts.

Goals

The Solomon *proof-of-concept* will validate the theoretical approach underlying the system — which, in short, is to model QA on a more sophisticated form of human-machine interaction: one in which the machine has the power of cutting-edge machine reasoning technology. We will showcase five of Solomon’s distinguishing attributes in a sequence of six demonstrations.

Accomplishments

In accordance with our Statement of Work, we have completed the first of six proof-of-concept demonstrations. We have shown Solomon acquiring knowledge through a process akin to how humans learn by reading.

Value

Simply put, Solomon is able to answer analysts’ “harder” questions. Solomon integrates QA technology with the advanced IA assistant *Slate*. The combination of the two extends the *ease-of-use* of interactive QA to the entire IA process and addresses four core needs of analysts: to **avoid bias**, to **dodge deception**, to **handle novelty**, and to **justify conclusions**.

For detailed information as to why QA systems must answer “harder” questions to sufficiently assist analysts, please see the white paper [Harder, Knowledge-Based QA Questions for Intelligence Analysts and the Researchers Who Want to Help Them](http://www.cogsci.rpi.edu/research/rair/solomon/publications.php).¹

¹ The white paper is available electronically at <http://www.cogsci.rpi.edu/research/rair/solomon/publications.php>.

