HITIQA: An Interactive Question Answering System A Preliminary Report

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Abstract

HITIQA is an interactive question answering technology designed to allow intelligence analysts and other users of information systems to pose questions in natural language and obtain relevant answers, or the assistance they require in order to perform their tasks. Our objective in HITIQA is to allow the user to submit exploratory, analytical, non-factual questions, such as *"What has been Russia's reaction to U.S. bombing of Kosovo?"* The distinguishing property of such questions is that one cannot generally anticipate what might constitute the answer. While certain types of things may be expected (e.g., diplomatic statements), the answer is heavily conditioned by what information is in fact available on the topic. From a practical viewpoint, analytical questions are often under-specified, thus casting a broad net on a space of possible answers. Therefore, clarification dialogue is often needed to negotiate with the user the exact scope and intent of the question.

1 Introduction

HITIQA project is part of the ARDA AQUAINT program that aims to make significant advances in the state of the art of automated question answering. In this paper we focus on two aspects of our work:

1. Question Semantics: how the system "understands" user requests.
2. Human-Computer Dialogue: how the user and the system negotiate this understanding.

We will also discuss very preliminary evaluation results from a series of pilot tests of the system conducted by intelligence analysts via a remote internet link.

2 Factual vs. Analytical

The objective in HITIQA is to allow the user to submit and obtain answers to exploratory, analytical, non-factual questions. There are very significant differences between factual, or fact-finding, and analytical question answering. A factual question seeks pieces of information that would make a corresponding statement true (i.e., they become facts): "How many states are in the U.S.?" / "There are X states in the U.S." In this sense, a factual question usually has just one correct answer that can generally, be judged for its truthfulness. By contrast, an analytical question is when the "truth" of the answer is more a matter of opinion and may depend upon the context in which the question is asked. Answers to analytical questions are rarely unilateral, indeed, a mere "correct" answer may have limited value, and in some cases may not even be determinate ("Which college is the best?", "How do I stop my baby's crying?"). Instead, answers to analytical questions are often judged as helpful, or useful, or satisfactory, etc. "Technically correct" answers (e.g., "feed the baby milk") may be considered as irrelevant or at best unresponsive.

The distinction between factual and analytical questions depends primarily on the intention of the person who is asking, however, the form of a question is often indicative of which of the two classes it is more likely to belong to. Factual questions can be classified into a number of syntactic formats ("question typology") that aids in automatic processing.

Factual questions display a fairly distinctive "answer type", which is the type of the information piece needed to fulfill the statement. Recent automated systems for answering factual questions deduct this expected answer type from the form of the question and a finite list of possible answer

types. For example, “Who was the first man in space” expects a “p