

Building Watson

An overview of the DeepQA project

Motivation:

There is growing interest to have enterprise computer systems deeply analyze the breadth of relevant content to more precisely answer and justify answers to user's natural language questions. We believe advances in question-answering (QA) technology can help support professionals in critical and timely decision making in areas like compliance, health care, business integrity, business intelligence, knowledge discovery, enterprise knowledge management, security, and customer support.

Related work:

For researchers, the open-domain QA problem is attractive as it is one of the most challenging in the realm of computer science and artificial intelligence, requiring a synthesis of information retrieval, natural language processing, knowledge representation and reasoning, machine learning, and computer-human interfaces. It has had a long history (Simmons 1970) and saw rapid advancement spurred by system building, experimentation, and government funding in the past decade (Maybury 2004, Strzalkowski and Harabagiu 2006).

Methodology:

- The Jeopardy Challenge
- The DeepQA Approach
- Human Champion Performance
 - There are a wide variety of ways one can attempt to characterize the Jeopardy clues. For example, by topic, by difficulty, by grammatical construction, by answer type, and so on. A type of classification that turned out to be useful for us was based on the primary method deployed to solve the clue.

Results and conclusion:

The results strongly suggest that DeepQA is an effective and extensible architecture that may be used as a foundation for combining, deploying, evaluating, and advancing a wide range of algorithmic techniques to rapidly advance the field of QA.

The architecture and methodology developed as part of this project has highlighted the need to take a systems-level approach to research in QA, and we believe this applies to research in the broader field of AI.