

Question Answering and Chatbots

7th Practical exercise – IR-based QA

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Hochschule Anhalt

Anhalt University of Applied Sciences

Plan for today

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- Demo session;

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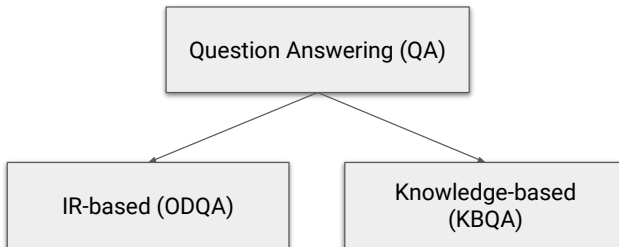
- Demo session;
- Discussion on the projects;

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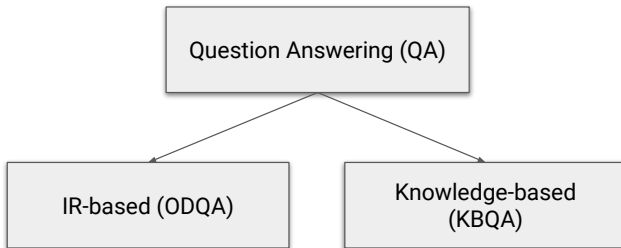
- Demo session;
- Discussion on the projects;
- Introduction of task 7.

Let's start the demo!

Recap: Paradigms of Question Answering

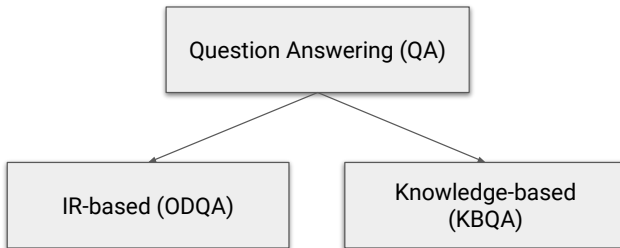


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- **Knowledge-based QA** – works with structured data.

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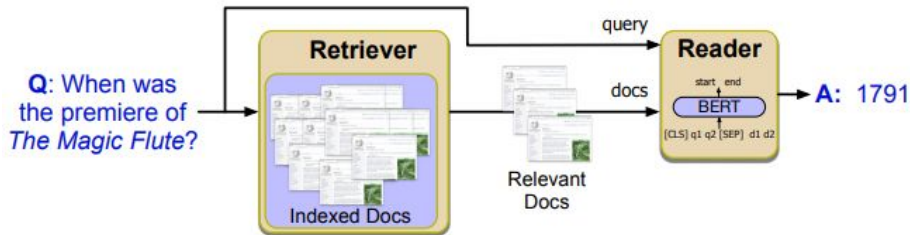
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- 1 Retrieve the most relevant document (“passage”) among the others (*retriever step*);
- 2 Find the answer in the retrieved document by *extracting a textual span from it (reader step/reading comprehension)*.

Retriever-Reader Architecture



<https://web.stanford.edu/~jurafsky/slp3/23.pdf>

Approaches for the Retriever step

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- Keyword-based search (word count);
- (1) Index the documents, (2) encode a question, (3) score the documents;
- But, we can try something else e.g., look for abstracts of named entities in a knowledge graph.

Approaches for the Reader step

The most common approach is the *machine reading comprehension* (MRC) model

What did the General Conference on Weights and Measures name after Tesla in 1960?

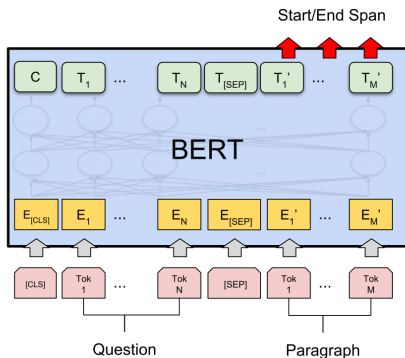
Ground Truth Answers: SI unit of magnetic flux density

Tesla was renowned for his achievements and showmanship, eventually earning him a reputation in popular culture as an archetypal "mad scientist". His patents earned him a considerable amount of money, much of which was used to finance his own projects with varying degrees of success.:121,154 He lived most of his life in a series of New York hotels, through his retirement. Tesla died on 7 January 1943. His work fell into relative obscurity after his death, but in 1960 the General Conference on Weights and Measures named the SI unit of magnetic flux density the tesla in his honor. There has been a resurgence in popular interest in Tesla since the 1990s.

Liu, Zhiyuan. Lin, Yankai. Sun, Maosong. (2020). Document Representation.

Approaches for the Reader step

One of the examples: BERT for question-answering



Devlin, Jacob, et al. "Bert: Pre-training of deep bidirectional transformers for language understanding."

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Task 2

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- Work with your project team members on a first sketch of the system that should fulfill your project.
- Collect 10+ questions and the corresponding answers that should be answered in German and English.
- Create a sketch of the QA components (processing steps).

Any questions?

Let's start the work.

- 0 Introduction;
- 1 NER & NEL;
- 2 Question classification & Web service/API;
- 3 SPARQL queries over Knowledge Graphs;
- 4 Simple KGQA system – based on exercises 0, 1, 2, 3;
- 5 Qanary Framework – component oriented approach;
- 6 Evaluation of QA systems;
- 7 **Simple IR-based/ODQA system.**