MACAQ : A Multi Annotated Corpus to study how we adapt Answers to various Questions

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Overview

1. Why a corpus of human answers?

2. Corpus constitution
   - List of questions
   - Corpus of answers

3. Corpus annotation
   - Automatic non-specific annotations
   - Manual specific annotations

4. Conclusion
Provide a *natural-language answer*

**What is QA?**

Q: *Where is the Mona Lisa?*
A1: *Louvre Museum*
A2: The Mona Lisa is in the Louvre Museum in Paris.

**Our Goal**

Provide a corpus of answers in natural language
From **QA systems answer** to **natural-language answer**

**Evaluation campaigns answer**

*in the Louvre* + an extract of the document where the answer was found

**Multiple natural-language answer forms**

- The Mona Lisa *is exhibited* in the Louvre Museum.
- It *is exhibited* in the Louvre Museum.
- The Mona Lisa *is* in the Louvre Museum.
- It *is* in the Louvre Museum the Mona Lisa *is exhibited*.
- The Mona Lisa *is a work of Léonard de Vinci* exhibited in the Louvre Museum.

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Which surface form?

What to say? How to say it?

*The Mona Lisa* is exhibited in the Louvre Museum.

*It* is exhibited in the Louvre Museum.

?
Which surface form?

What to say? How to say it?

*The Mona Lisa is exhibited* in the Louvre Museum.

*It is* in the Louvre Museum *the Mona Lisa is exhibited.*

?
Overview

Corpus constitution

Corpus annotation

Conclusion

Why a corpus of human answers?

Corpus annotation

Conclusion

Which surface form?

What to say? How to say it?

The Mona Lisa is exhibited in the Louvre Museum.

The Mona Lisa is a work of Léonard de Vinci exhibited in the Louvre Museum.

?
### Which surface form?

**What to say? How to say it?**

*The Mona Lisa is exhibited in the Louvre Museum.*

*The Mona Lisa is a work of Léonard de Vinci exhibited in the Louvre Museum.*

?  

**Hypothesis**

Answer surface form depends on question surface form
Which surface form?

What to say? How to say it?

*The Mona Lisa* is exhibited in the Louvre Museum.
*The Mona Lisa* is a *work of* Léonard de Vinci exhibited in the Louvre Museum.

Hypothesis

Answer surface form depends on question surface form

The corpus

Human answers to various questions

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Using existing corpora

Existing answers: QA campaign answers

in the Louvre Museum, Paris, France, ...

Too short
Existing answers: collaborative QA website

Q: What was Lewis Carroll’s first job?
A: Lewis Carroll (Charles Lutwidge Dodgson) was born in Daresbury Parsonage, Daresbury, Cheshire, on 27 January 1832, the third child and eldest son of Rev. Charles Dodgson and his wife Frances. Altogether, there were eleven Dodgson children, and all of them survived; quite unusual for those days!

Too long, complex

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Existing answers

Existing questions: QA campaign answers

How many chickens are available for adoption at the Camden County Animal Shelter?

Topic too complex, not available in different syntactic forms
Using existing corpora

**Existing answers**

**Existing questions: collaborative QA website**

Under what condition the average speed is equal to the magnitude of the average velocity?

Too long, topic complex
Using existing corpora

Existing answers

Existing questions

Modality of interaction

QA systems are available for written and speech interaction... Corpora are not.

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**Existing answers**

**Existing questions**

**Modality of interaction**

QA systems are available for written and speech interaction... Corpora are not.

**We need to build a new corpus**
Corpus acquisition methodology

We ask a question, the user answers it.

Corpus of questions:
- controlled variations of the same question
- easy questions: to minimize “I don’t know”-type answers

Users:
- French native speakers

Modalities:
- oral interaction over the phone
- written interaction on a website

Protocol:
- 18 to 24 questions per session
# Corpus of questions

**Factoid and simple**

| question markers | principal verb | nominal phrase (focus) | other |
|------------------|----------------|------------------------|-------|

**Example**

- **Combien pèse un bébé à la naissance?**
- **How much does a baby weight at birth?**
Corpus of questions

Factoid and simple

- question markers
- principal verb
- nominal phrase (focus)
- other

Variation:

- Où est la Joconde ? (Where is the Mona Lisa?)
- Quand sont les JO ? (When are the Olympic Games?)
- Combien mesure la Tour Eiffel ? (How tall is the Eiffel Tower?)

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Corpus of questions

Factoid and simple

- question markers
- principal verb
- nominal phrase (focus)
- other

Variation:

Où est la Joconde ? (Where is the Mona Lisa?)
Dans quel musée est la Joconde ? (In which museum is the Mona Lisa?)
La Joconde est-elle au Louvre ? (Is the Mona Lisa in the Louvre Museum?)
### Corpus of questions

#### Factoid and simple

| question markers | principal verb | nominal phrase (focus) | other |
|------------------|----------------|------------------------|-------|

#### Variation:

- **Où est la Joconde?**  
  *(Where is the Mona Lisa?)*

- **La Joconde est où?**  
  *(The Mona Lisa is where?)*

- **Je voudrais savoir où est la Joconde?**  
  *(I would like to know where is the Mona Lisa?)*
## Corpus of questions

### Factoid and simple

| question markers | principal verb | nominal phrase (focus) | other |
|------------------|----------------|------------------------|-------|

### Variation:

| Où est la Joconde ? (Where is the Mona Lisa?) |
|---------------------------------------------|
| Où est exposée la Joconde ? (Where is exhibited the Mona Lisa?) |
Corpus of questions

Factoid and simple

- question markers
- principal verb
- nominal phrase (focus)
- [ other ]

Variation:

Dans quel musée est la Joconde?  \textit{NE museum}

Dans quel pays est la Joconde?  \textit{NE country}

La Joconde est-elle au Louvre?  \textit{Yes-No}
Corpus of questions

**Factoid and simple**

| question markers | principal verb | nominal phrase (focus) | other |
|------------------|----------------|------------------------|-------|

**Variation:**

- Où est **la Joconde** ? (Where is the Mona Lisa?)
- Où est **le Rhin** ? (Where is the Rhin River?)
General description of the corpus

More than 3,000 answers and 6 answers per question

|                                | Written | Speech | Total |
|--------------------------------|---------|--------|-------|
| # answers                      | 2,088   | 1,044  | 3,132 |
| # different questions          | 507     | 493    | 507   |
| # subjects                     | 99      | 53     | 152   |
| # subjects/question            | 4.12    | 2.12   | 6.17  |
| # words                        | 17,976  | 7,128  | 25,104|
| # different words              | 3,363   | 1,634  | 4,574 |

Table: General characteristics of the corpus
Annotations

**Automatic annotations**
Non specific to the QA context

**Manual annotations**
Specific to the QA context
Automatic non-specific annotations

| Lemmatisation |
|---------------|
| Raw | La Joconde est actuellement au Louvre |
| Lemmatised | le Joconde être actuellement au Louvre |

| Part-of-speech tagging |
|------------------------|

| Syntactic parsing |
|---------------------------------|

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Automatic non-specific annotations

Lemmatisation

Part-of-speech tagging

| Raw | La Joconde est actuellement au Louvre |
|-----|--------------------------------------|
| POS | DET NAM VER ADV PRP:det NAM          |

Syntactic parsing

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Automatic non-specific annotations

**Lemmatisation**

**Part-of-speech tagging**

**Syntactic parsing**

### Syntactic Parsing

| Raw       | La Joconde est actuellement au Louvre |
|-----------|---------------------------------------|
| Syntactic Parsing |                                      |
| DET       | La                                    |
| NOUN      | Joconde                               |
| VERB      | est                                   |
| ADV       | actuellement                          |
| PREP      | au                                    |
| NOUN      | Louvre                                |
Manual specific annotations

### Linguistic link between Q and A

| Words reused from the question in the answer: |
|---------------------------------------------|
| question markers | principal verb | nominal phrase (focus) | [other] |

| Question | Où est la Joconde ? |
| Answer   | La Joconde est actuellement au Louvre |

### The answer itself

### Additional elements

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Manual specific annotations

Linguistic link between Q and A

The answer itself

Definition of the Information-answer as the shortest part of the answer which consists either:
(1) of a new information which corresponds to the question expected type (EN, Yes-No)
(2) or of an admission of incompetence

| Raw Annotation | La Joconde est actuellement au Louvre |
|----------------|--------------------------------------|
| Raw Annotation | La Joconde est actuellement au Louvre |

Additional elements

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### Manual specific annotations

#### Linguistic link between Q and A

#### The answer itself

#### Additional elements

Completion, suggestion and irrelevance were manually annotated

| Completion       | Le 11 novembre 1918 à Rethondes |
|------------------|---------------------------------|
| Suggestion       | Je ne suis pas sûr, il faut chercher dans un dictionnaire. |
| Suggestion       | *I am not sure, you should look in a dictionary.* |
| Irrelevance      | vas dans ta chambre :P [sic] |
| Irrelevance      | *Go to your room :P* |
Manual specific annotations

Linguistic link between Q and A

The answer itself

Additional elements

Examples
La Joconde est actuellement au Louvre à Paris.
Manual specific annotations

Linguistic link between Q and A

The answer itself

Additionnal elements

Examples

La Joconde est actuellement au Louvre à Paris.
Conclusion

A corpus of natural-language answers

- answering questions with controlled linguistic features
- speech and written modalities
- annotated automatically and manually

Useful for...

- comparison speech/written
- answer generation
- interactive question-answering
- ... and what you want!

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Thanks!