

Harnessing Scientific AI for Knowledge Discovery:

ORKG Ask

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of the European Union



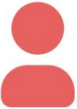









Outline

- Recap
- Introduction to ORKG Ask
- Frontend
 - Features
 - Best practices for writing research applications
- Backend
 - RAG approach
 - LLM + Prompts
- Evaluation

Outline

- **Recap**
- Introduction to ORKG Ask
- Frontend
 - Features
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- Evaluation

Human-AI collaboration

	AI-Absent User performs tasks manually without AI	AI-Augmented Human is assisted by the AI during the task	AI-Driven AI is assisted by the human during the AI	AI-Exclusive AI performs tasks independently
Input	 ↓	 ↓ ←  Assistance	 ↓ ←  Assistance	 ↓
Output				
Scalability	●	● ●	● ● ●	● ● ● ●
Quality	● ● ●	● ● ● ●	● ●	●

Human-AI collaboration in the ORKG

AI-Augmented

1. Smart suggestions

AI-supported tooltips helping users accomplish their tasks

2. Paper annotator

Annotation of key sentences in scholarly PDF articles

3. Survey extractor

Extract survey tables from existing papers

AI-Driven

4. TinyGenius

Microtasks to validate NLP generated statements

5. ORKG Ask

Today's topic

Human-AI collaboration in the ORKG

AI-Augmented

1. Smart suggestions

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AI-Driven

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5. ORKG Ask

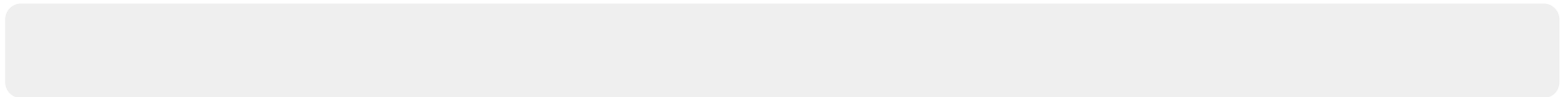
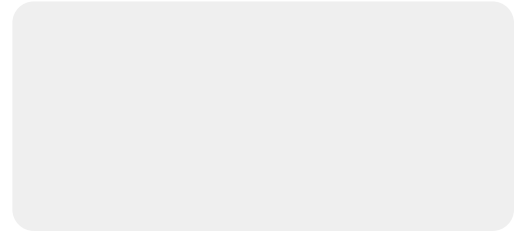
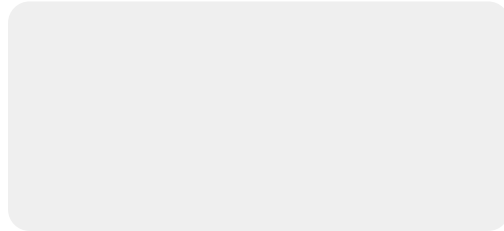
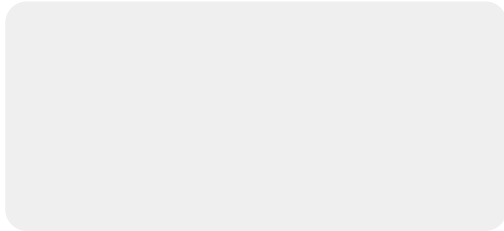
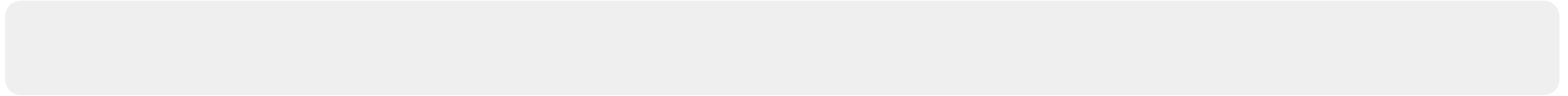
Today's topic

Outline

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- **Introduction to ORKG Ask**
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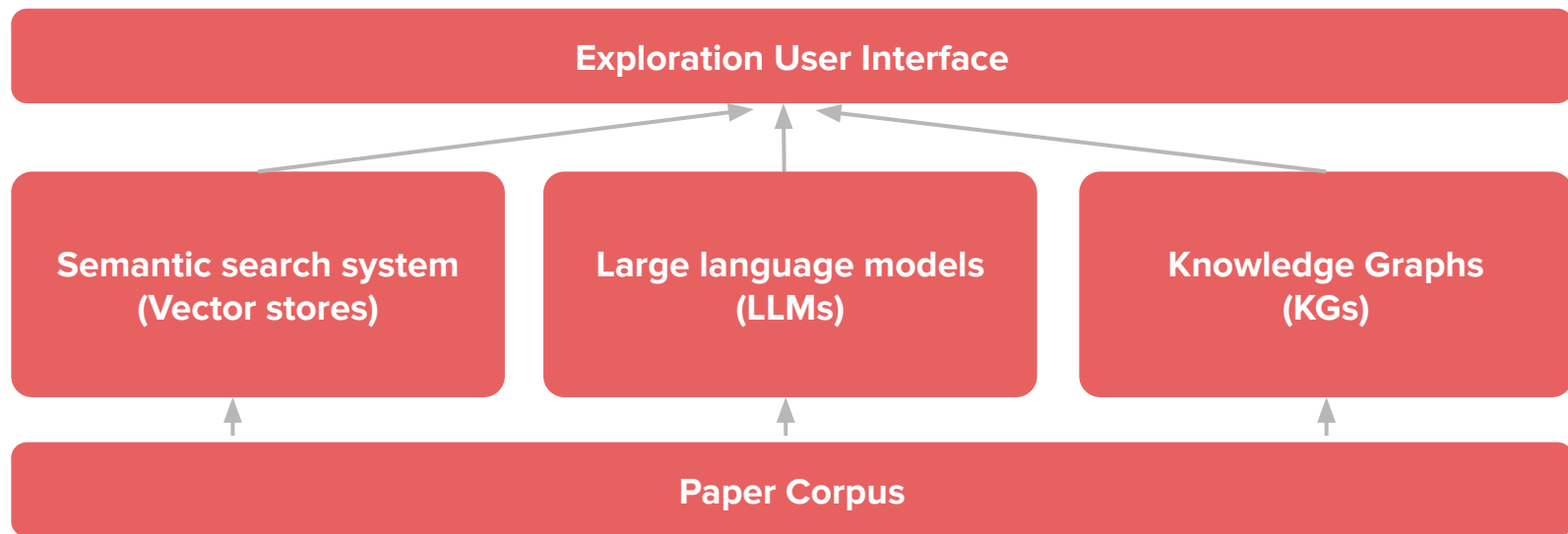
Introducing ORKG Ask

- **Mission:** empower researchers to help them **find** and **explore** research articles
- **Architecture** of ORKG Ask



Introducing ORKG Ask

- **Mission:** empower researchers to help them **find** and **explore** research articles
- **Architecture** of ORKG Ask



System requirements

- Definition of functional and non-functional requirements to guide system development and evaluation

Functional requirements

FR1: Literature search

FR2: Information extraction

FR3: Answer synthesis

FR4: Result filtering

FR5: Bibliography manager

Non-functional requirements

NFR1: Usability

NFR2: Accessibility

NFR3: Maintainability

NFR4: Interoperability

NFR5: Performance

ORKG Ask



Frontend



Backend

ORKG Ask



Frontend



Backend

Search query
How does exposure to nature affect overall health and well-being?

Search

Filters

Year

Language

Add filter...

ORKG Ask is brought to you by



Answer (based on top 5 papers)

Exposure to nature, as shown in multiple studies Overall, the evidence suggests that interaction with nature has a positive impact on health and well-being. [1]

Answer Insights TL;DR Conclusions

Why is nature beneficial? The role of connectedness to nature

Mayer, F. Stephan • Frantz, Cynthia M. • Bruehlman-Senecal, E. • Dolliver, Kyffin September 2009 [doi:10.1177/0013916508319745](https://doi.org/10.1177/0013916508319745)

Exposure to nature increases connectedness to nature, attentional capacity, positive emotions, and ability to reflect on a life problem.,Effects are more dramatic for actual nature than for virtual nature.

The study discusses the mechanisms underlying the exposure to nature/well-being effects and the ecological validity of laboratory studies.

Exposure to nature improves connectedness to nature, enhances cognitive abilities, and boosts positive emotions.

N/A

Is Nature Relatedness Associated with Better Mental and Physical Health?

Julie H. Dean • Danielle F. Shanahan • Robert Bush • Kevin J. Gaston • Brenda B. Lin • Elizabeth Barber • Lara Franco • Richard A. Fuller

People with higher nature relatedness reported better overall health and fewer symptoms of depression, anxiety, and stress.,Aspects of nature relatedness reflecting enjoyment of nature were consistently associated

The findings suggest that interventions designed to increase nature relatedness, particularly enjoyment of nature, could improve health outcomes.

Higher nature relatedness is linked to better overall health and fewer symptoms of depression, anxiety, and stress. Enjoying nature specifically may be beneficial.

Findings suggest increase nature benefits.

FR1: Literature search



Question answering



Reference
manager

BibTeX powered



Filtering



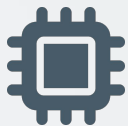
Custom
extraction



Saved searches



Export



Latest technologies

Responsive

Dark mode



Paper details



Question answering



Reference
manager

BibTeX powered



Filtering



Custom
extraction



Saved searches



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Dark mode



Paper details

? Question answering

Search query

How does exposure to nature affect overall health and well-being?

Q Search

Answer | Insights

Why is nature beneficial? The role of connect

Mayer, F. Stephan • Frantz, Cynthia M. • Bruehl

Exposure to nature increases connectedness to nature, attentional capacity, positive emotions, and ability to reflect on a	The study of underlying being effect of laborat
--	---

Paper-based answer

FR2: Information extraction

Answer (based on top 5 papers)

Exposure to nature, as shown in multiple stud improved ability to reflect on life problems. Ac depression, anxiety, and stress, as well as be nature, which reduce stress [5], and the resul evidence suggests that interaction with natur

Synthesized answer

FR3: Answer synthesis



Question answering



Reference
manager

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Filtering



Custom
extraction



Saved searches



Export



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Dark mode



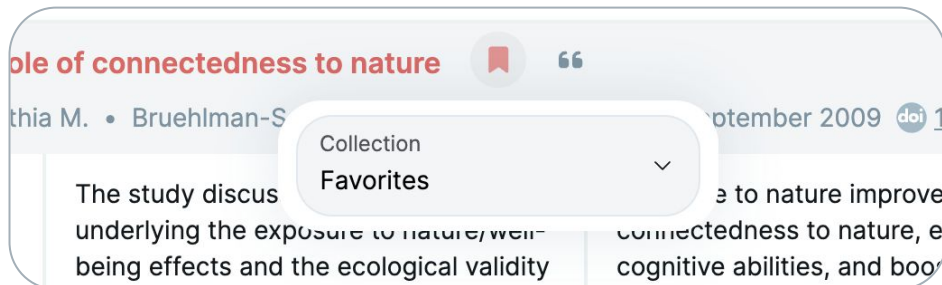
Paper details

Reference manager

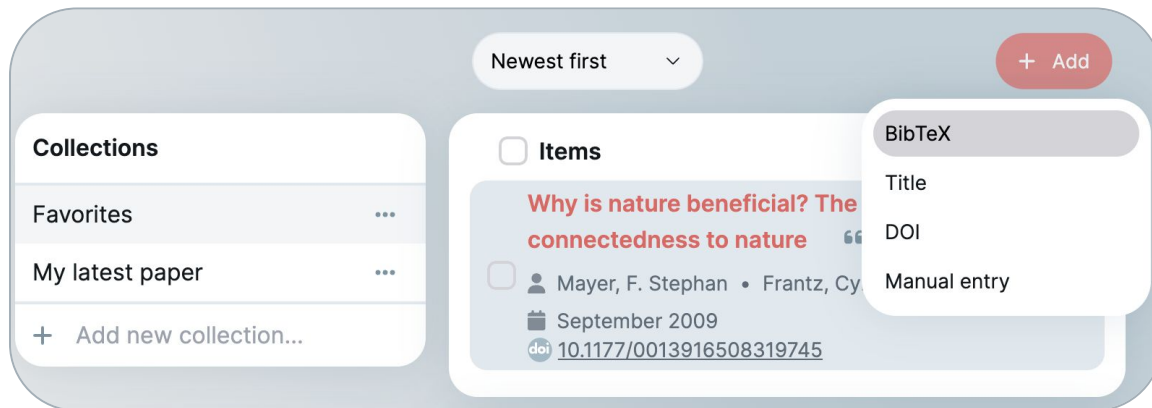
FR5: Bibliography manager

NFR4: Interoperability

Add papers to
My library



Add additional
entries, or upload
your entire
bibliography



66 Reference manager

FR5: Bibliography manager

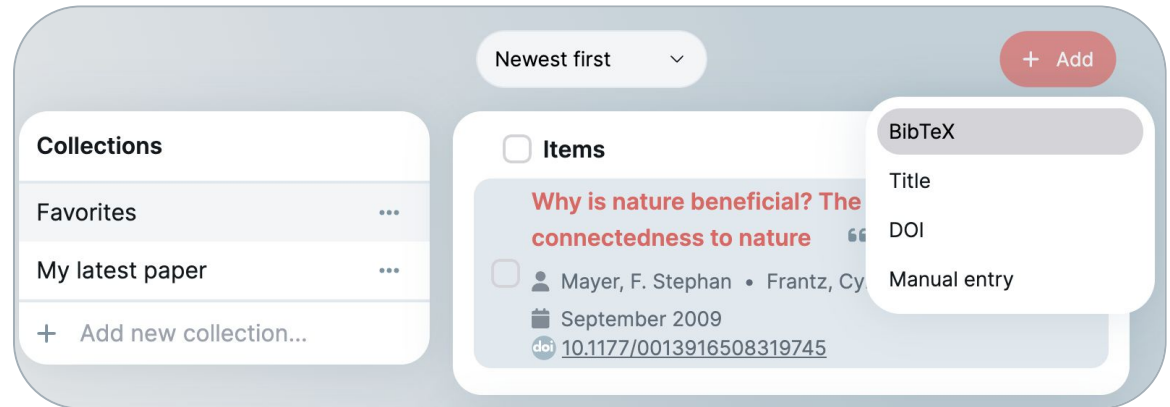
NFR4: Interoperability



or



Import existing bibliographies



66 Reference manager

FR5: Bibliography manager

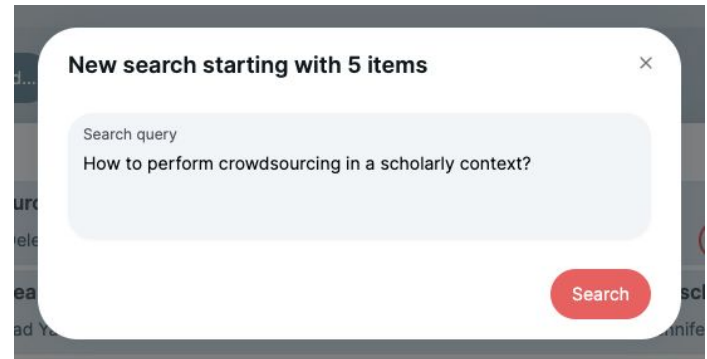
NFR4: Interoperability



or



Extraction information from
your own bibliography





Question answering



Reference
manager

BibTeX powered



Filtering



Custom
extraction



Saved searches



Export



Latest technologies

Responsive

Dark mode



Paper details

Filtering

Filters

Year

1950 till 2024

Reset

Language

Search...

- Afar
- Abkhazian
- Avestan
- Afrikaans
- Akan

Use the default filters

FR4: Result filtering

Abstract (1)

Contains mental health ×

Add filter...

Field*
Abstract ▾

Contains ▾ outdoors

Add

Or create custom filters

Filtering

Language

Add filter...

Field *
Topic






Topic
Machine learning

- Azure Machine Learning Studio
- Probabilistic Machine Learning
- Robust Machine Learning
- Ensemble Averaging (Machine Learn...
- Kernel Methods For Machine Learning

Filter by topics (from DBpedia)

FR4: Result filtering

Mentions

-  Finland
Place
-  New York Times
Daily newspaper
-  International
Public company
-  Planetary boundary layer
Thing
-  SDGs
Classification scheme

Or explore topics per paper

Filtering

FR4: Result filtering

Language






Add filter...

Field *
Topic

Topic
Machine learning ^

- Azure Machine Learning Studio
- Probabilistic Machine Learning
- Robust Machine Learning
- Ensemble Averaging (Machine Learn...
- Kernel Methods For Machine Learning

Mentions

-  Finland
Place
-  New York Times
Daily newspaper
-  International
Public company
-  Planetary boundary layer
Thing
-  SDGs
Classification scheme

Currently in development

Filter by topics (from DBpedia)

Or explore topics per paper



Question answering



Reference
manager

BibTeX powered



Saved searches



Export



Filtering



Custom
extraction



Latest technologies

Responsive

Dark mode



Paper details

BibTeX powered

NFR4: Interoperability

Cite ×

BibTeX ▾

% Data generated by ORKG Ask 1.3.3 -
<https://ask.orkg.org>

```
@article{Mayer2009Why,  
  author = {{Mayer, F. Stephan} and  
    {Frantz, Cynthia M.} and {Bruehlman-  
    Senecal, E.} and {Dolliver, Kyffin}},  
  doi = {10.1177/0013916508319745},  
  year = {2009},  
  month = {9},  
  publisher = {'SAGE Publications'},  
  title = {Why is nature beneficial?  
  {The} role of connectedness to nature},  
}
```

Export as BibTeX

BibTeX import ×

BibTeX file (optional)

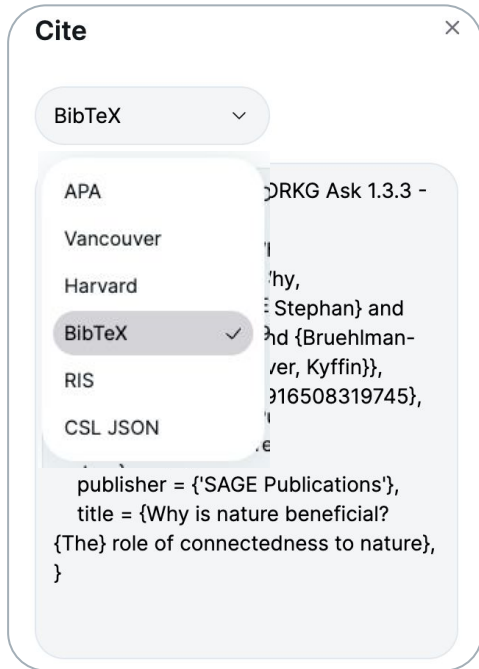
No file chosen

BibTeX

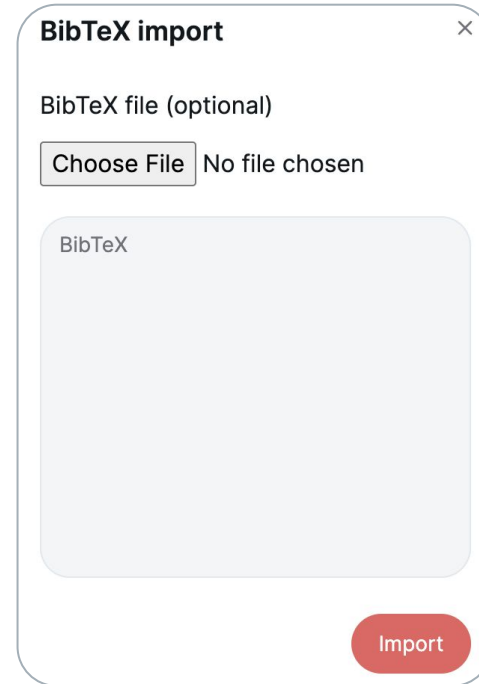
Import BibTeX

BibTeX powered

NFR4: Interoperability



Export as BibTeX



Import BibTeX



Question answering



Reference
manager

BibTeX powered



Filtering



Custom
extraction



Saved searches



Export



Latest technologies

Responsive

Dark mode



Paper details



Saved searches

Save searches and make them part of your research workflow

Save search



Title

How does exposure to nature affect overall health and w

Save

Retrieve previously saved searches

Saved searches

What role does cultural heritage play in shaping national identity? ...

📅 Today at 10:51

What are the interesting theories about dark matter and dark energy? ...

📅 Yesterday at 14:12

How does exposure to nature affect overall health and well-being? ...



Question answering



Reference
manager

BibTeX powered



Filtering



Custom
extraction



Saved searches



Export



Latest technologies

Responsive

Dark mode



Paper details

Export

ORKG export ×

To import the content into the ORKG, you first need to download the *ORKG CSV* file which you then need to import into the *ORKG CSV import tool*.

1. Download file

 [Download ORKG CSV](#)

2. Import in ORKG

Import the file into the [ORKG CSV Import tool](#).

Export results to ORKG and use it
for creating a new comparison

NFR4: Interoperability

 Hidden

 [CSV](#)

 ORKG

Export results to CSV

APA

Vancouver

Harvard

BibTeX

RIS

CLS JSON

Export papers



Question answering



Reference
manager

BibTeX powered



Filtering



**Custom
extraction**



Saved searches



Export



Latest technologies

Responsive

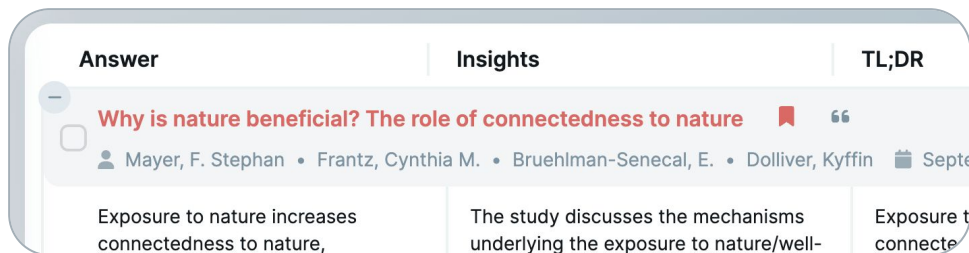
Dark mode



Paper details

Custom extraction

Extract additional knowledge by changing the columns of the results table



Answer	Insights	TL;DR
<p>Why is nature beneficial? The role of connectedness to nature</p> <p>Mayer, F. Stephan • Frantz, Cynthia M. • Bruehlman-Senecal, E. • Dolliver, Kyffin</p> <p>Exposure to nature increases connectedness to nature,</p>	<p>The study discusses the mechanisms underlying the exposure to nature/well-</p>	<p>Exposure t connecte</p>

Edit columns

Selected columns

≡ Answer ×

≡ Insights ×

≡ TL;DR ×

≡ Conclusions ×

≡ Results ×

≡ Methods ×

≡ Limitations ×

+ Add new column...



Question answering



Reference
manager

BibTeX powered



Filtering



Custom
extraction



Saved searches



Export



Latest technologies

Responsive

Dark mode



Paper details

Paper details

Find details about individual papers, including a list of related papers

Planetary boundaries: Guiding human development on a changing planet

Will Steffen • Katherine Richardson • Johan Rockström • Sarah E. Cornell • Ingo Fetzer • Elena M. Bennett • Reinette Biggs • Stephen R. Carpenter • Wim de Vries • [12 more](#)

[Open PDF](#)[Bookmark](#)[Cite](#)[Share](#)[View in ORKG](#)[Add to search](#)

 Publication date

15 January 2015

 DOI

10.1126/science.1259855

 Journal

Science

 Publisher

AAAS

 ISSN

0036-8075

 Funder

Stordalen Foundation, [6 more](#)

 Citations

12245

 Language

English

 License

AAAS Journal Article License

 References

157

TL;DR

The planetary boundary concept, created in 2009, identifies critical environmental limits. Steffen et al. update it, emphasizing three boundaries, including climate change, with profound global implications and a refined regional application.



Question answering



Reference
manager

BibTeX powered



Filtering



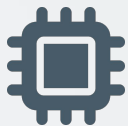
Custom
extraction



Saved searches



Export



Latest technologies

Responsive

Dark mode

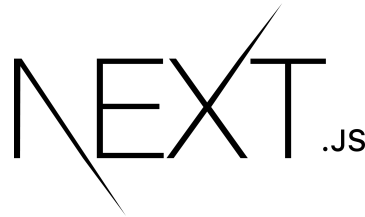


Paper details

Latest technologies

NFR3: Maintainability

The ORKG Ask frontend is using the latest web development technologies





Latest technologies

NFR3: Maintainability

- Frontend technologies in more detail
- Choosing a solid technology stack is important for:
 - **Contributors:** developers that are familiar with the stack can contribute more easily
 - **Documentation:** many libraries and frameworks come with documentation out-of-the-box, meaning less work for you
 - **Maintainability:** creating a tool (or prototype) is one thing, but maintaining it is often overlooked, but also of importance
 - **Quality:** generally, quality of third-party libraries is higher than if you would write it yourself (also, more feature-rich, better accessibility, etc.)



Latest technologies

NFR3: Maintainability

- Frontend technologies in more detail

- Choosing a solid technology stack is important for:



Keep yourself educated:

Make sure you are aware of the latest technologies and tools: don't just use something because you are familiar with it, but also: don't follow every trend



Maintainability: creating a tool (or prototype) is one thing, but maintaining it is often overlooked, but also of importance



Quality: generally, quality of third-party libraries is higher than if you would write it yourself (also, more feature-rich, better accessibility, etc.)



Latest technologies

NFR3: Maintainability

From:



To:



- JavaScript (JS) was the standard for the web for many years
- TypeScript (TS) adds typing to JavaScript
- Benefits:
 - Less unexpected errors in production
 - Easier to maintain
 - Refactoring easier
 - Improved IDE support



Latest technologies

NFR3: Maintainability

From:



To:

TS TypeScript



```
// JavaScript code
function greet(user) {
  console.log(`Hello, ${user.name}!`);
}

const user = { name: "Alice" };
greet(user);

const invalidUser = { username: "Bob" };
greet(invalidUser); // Error runtime
```

JavaScript



```
interface User {
  name: string;
}

function greet(user: User): void {
  console.log(`Hello, ${user.name}!`);
}

const user: User = { name: "Alice" };
greet(user);

const invalidUser = { username: "Bob" };
greet(invalidUser); // Type error
```

TypeScript



Latest technologies

NFR3: Maintainability

From:



To:

TS TypeScript

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JavaScript

```
function greet(user: User): void {
  console.log(`Hello, ${user.name}!`);
}

const user: User = { name: "Alice" };
greet(user);

const invalidUser = {
  username: string;
};

// TypeScript error
greet(invalidUser);
```

Argument of type '{ username: string; }' is not assignable to parameter of type 'User'.
Property 'name' is missing in type '{ username: string; }' but required in type 'User'. ts(2345)

Untitled-3(3, 5): 'name' is declared here.

View Problem (⌘F8) Quick Fix... (⌘.)

```
const user: User = { name: "Alice" };
greet(user);

const invalidUser = { username: "Bob" };
greet(invalidUser); // Type error
```

TypeScript

From:

JavaScript



Native code

To:



To:



- Back in the old day, native browser APIs were used directly to manipulate a web application (e.g. make an application interactive)

```
<div id="content">Old Content</div>
<button id="btn">Change Content</button>
<script>
  document.getElementById('btn').onclick = () => {
    document.getElementById('content').innerText = 'New Content';
  };
</script>
```



Latest technologies

NFR3: Maintainability

From:

JavaScript



Native code

To:



To:



- Then jQuery gains popularity, makes elements easier to select and code less verbose

```

<div id="content">Old Content</div>
<button id="btn">Change Content</button>
<script src="https://code.jquery.com/jquery-3.6.0.min.js"></script>
<script>
  $('#btn').click(() => {
    $('#content').text('New Content');
  });
</script>

```



Latest technologies

NFR3: Maintainability

From:

JavaScript

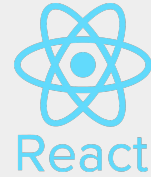


Native code

To:



To:



- Finally, libraries such as React become popular, making applications much more scalable and adopting declarative programming

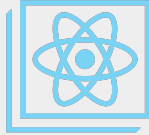
```
function App() {
  const [content, setContent] = useState('Old Content');
  return (
    <div>
      <div>{content}</div>
      <button onClick={() => setContent('New Content')}>Change Content</button>
    </div>
  );
}
```



Latest technologies

NFR3: Maintainability

From:



Create react app

To:

~~NEXT~~.JS

- Next.js is a framework for React, providing several components out of the box: routing, SSR, server components etc.
- Benefits:
 - More opinionated than React, less documentation needed
 - Easier to maintain
 - Support by third-party libraries



Latest technologies

NFR3: Maintainability

From: **Bootstrap**

To:

 NextUI



Tailwind CSS

- Better support for responsiveness and dark mode
- Accessible components out of the box
- Components libraries are always a discussion topic, some like them, others don't. My opinion:
 - To “do” components right is quite difficult, many things to consider, so better use existing (well maintained) libraries

Latest technologies - Design language

NFR1: Usability



Bento grid



Glassmorphism

Source: <https://uxmisfit.com/2021/02/03/glassmorphism-guide-to-visual-hierarchy/>



Find research you are *actually* looking for

Ask your question...



ORKG Ask is a scholarly search and exploration system powered by **Vector Search**, **Large Language Models** and **Knowledge Graphs**. [Learn more.](#)

76,430,671

Items with abstracts

Getting started

- What are the long-term effects of income inequality on community well-being?
- How can we promote mental health awareness and reduce stigma in educational settings?
- How can we promote financial literacy and responsible financial decision-making?
- How does social media affect the college selection process?
- What role does storytelling play in shaping collective memory and identity?

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Question answering



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Filtering



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Saved searches



Export



Latest technologies

Responsive

Dark mode



Paper details

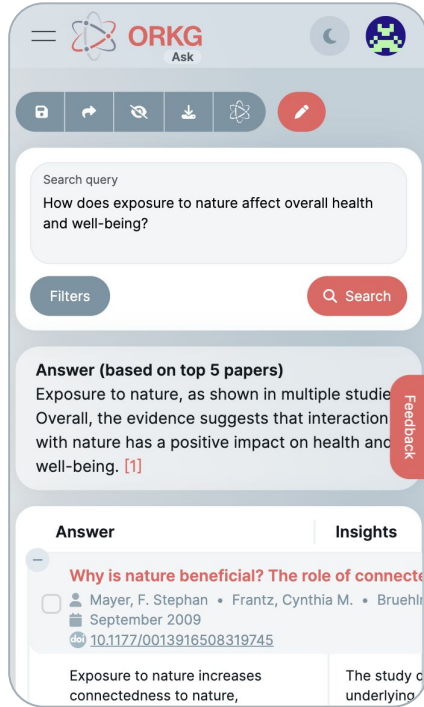
Accessibility

NFR2: Accessibility

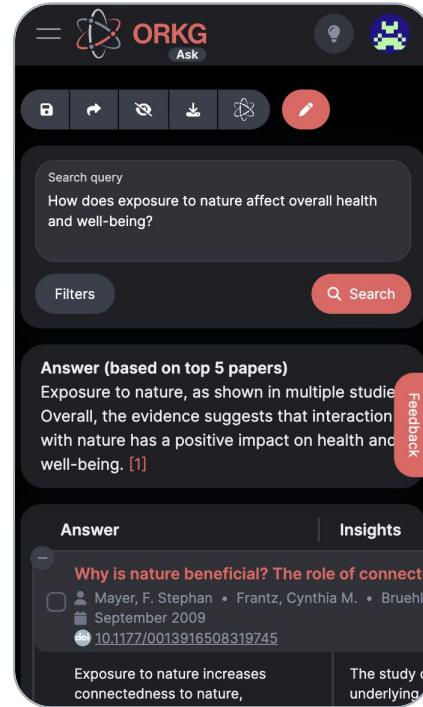
- “When websites and web tools are properly designed and coded, people with disabilities can use them.” - W3C
- “However, currently many sites and tools are developed with accessibility barriers that make them difficult or impossible for some people to use.” - W3C
- Permanent vs temporary vs situational disabilities
- Blind, Low vision, color blind, deafness, hearing impaired, motor, cognitive
- External tools, such as screen readers
- Accessible by design, not secondary or “save it for later”

Responsive & Dark mode

NFR2: Accessibility



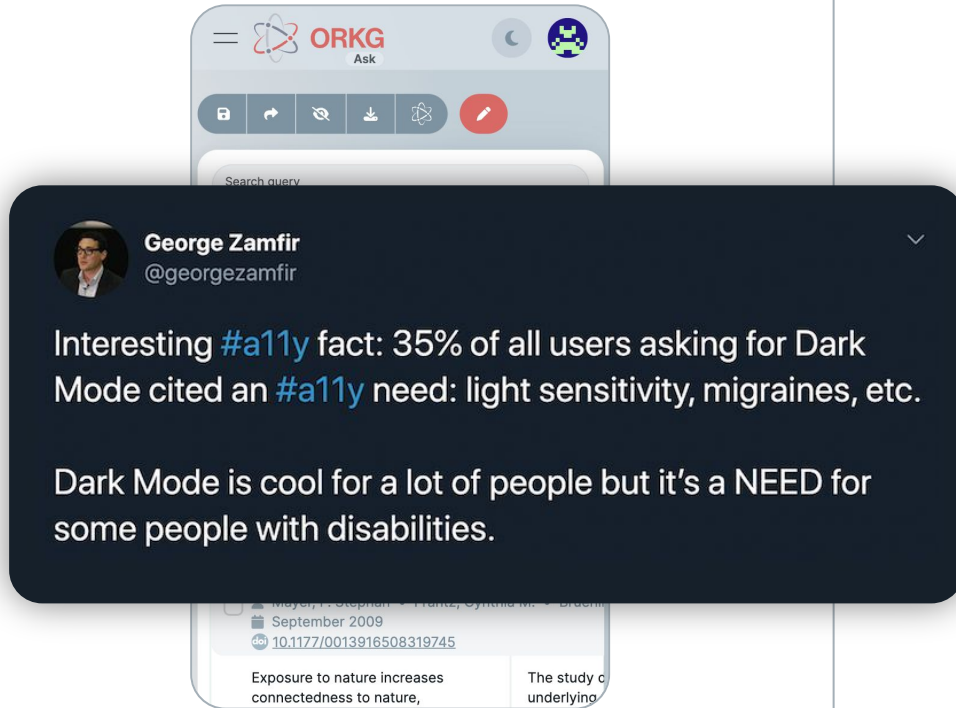
Fully responsive



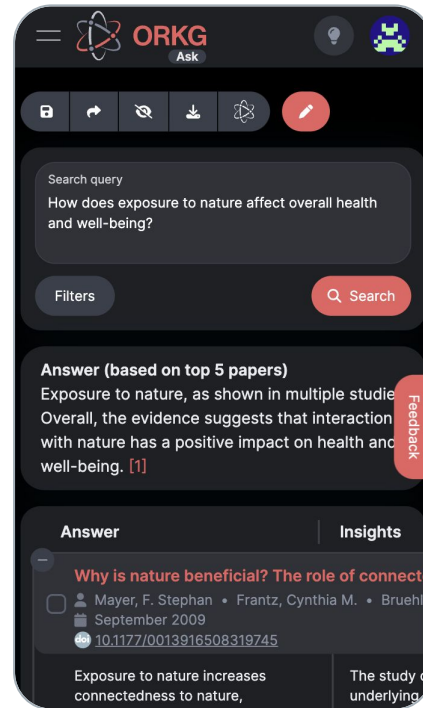
Dark mode

Responsive & Dark mode

NFR2: Accessibility



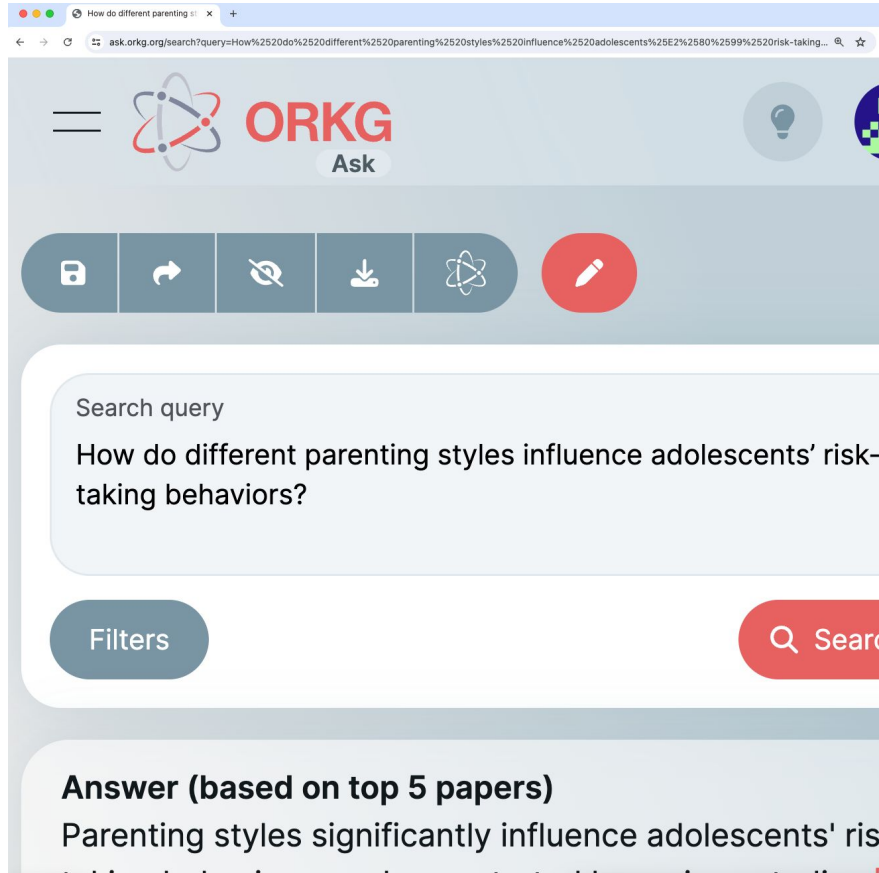
Fully responsive



Dark mode

Responsive & Dark mode

NFR2: Accessibility



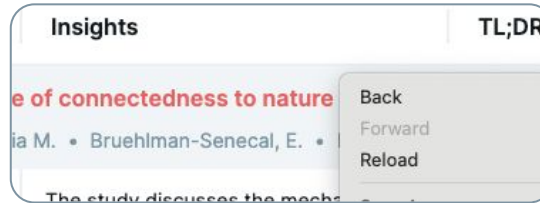
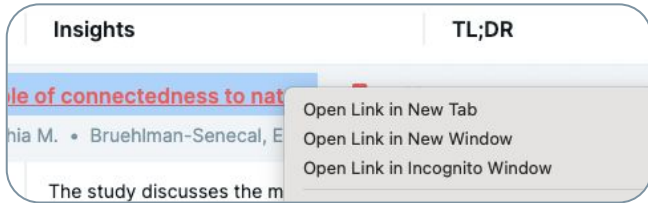
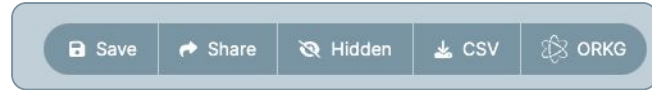
The screenshot shows a web browser window with the URL `ask.orkg.org/search?query=How%20do%20different%20parenting%20styles%20influence%20adolescents%20risk-taking...`. The page features the ORKG logo and a search bar containing the query: "How do different parenting styles influence adolescents' risk-taking behaviors?". Below the search bar, there are navigation icons for home, back, forward, refresh, and a red "Ask" button. A "Filters" button is visible on the left, and a "Search" button is on the right. The answer section is titled "Answer (based on top 5 papers)" and begins with "Parenting styles significantly influence adolescents' risk-taking behaviors, and several structural brain regions are..."

High zoom level

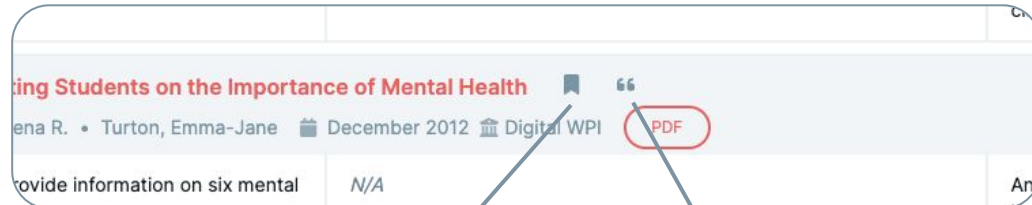
Accessibility benefits everyone

NFR2: Accessibility

- Use appropriate browser elements



- ARIA labels where needed



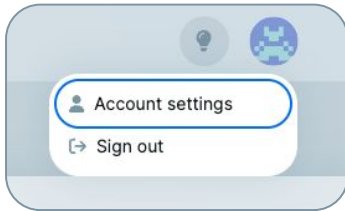
Add to collection

Cite article

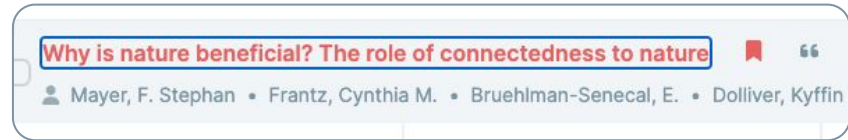
Accessibility benefits everyone

NFR2: Accessibility

- **Keyboard controlled elements:** crucial for visually impaired but helpful for other users as well



Arrow keys up/down



Use tab to navigate

- **Reponsive design:** high zoom and multiple devices
- **Clear error messages and workflows:** cognitive disabilities and general usability
- **Sufficient color contrasts:** good for visually impaired or when using a device in direct sunlight, or with low quality screens

ORKG **Ask**



Frontend Components

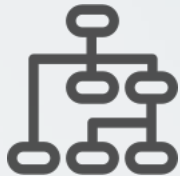


Backend Components

Thanks to Mohamad Yaser Jaradeh for the backend work



Caching Responses



RAG



Technologies



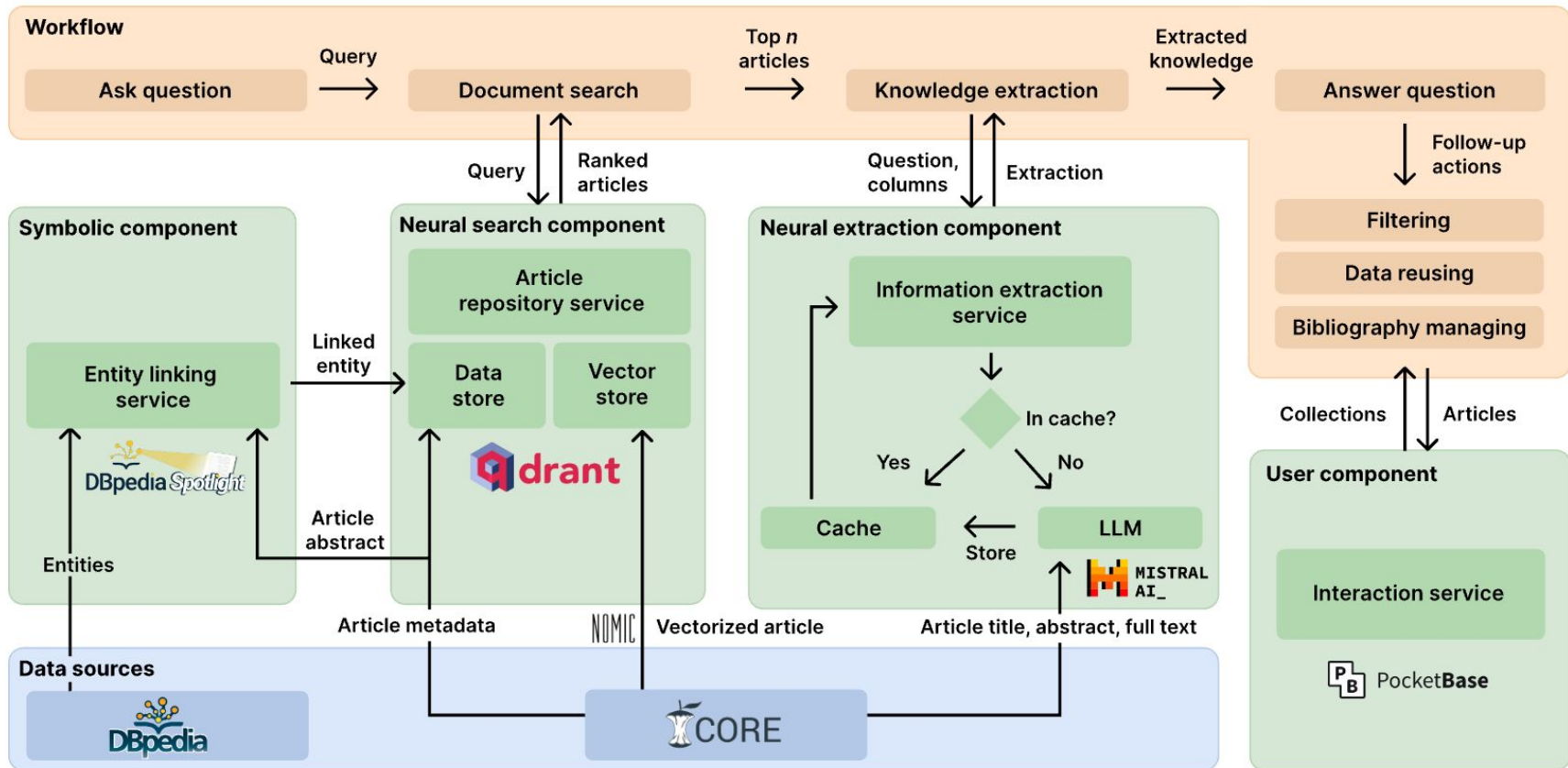
LLMs



Embeddings



Semantic Search



Oelen, Allard, Mohamad Yaser Jaradeh, and Sören Auer. "ORKG ASK: a Neuro-symbolic Scholarly Search and Exploration System" SEMANTiCS 2024 EU: 20th International Conference on Semantic Systems, September 17-19, 2024 (under review)



Caching Responses



RAG



Technologies



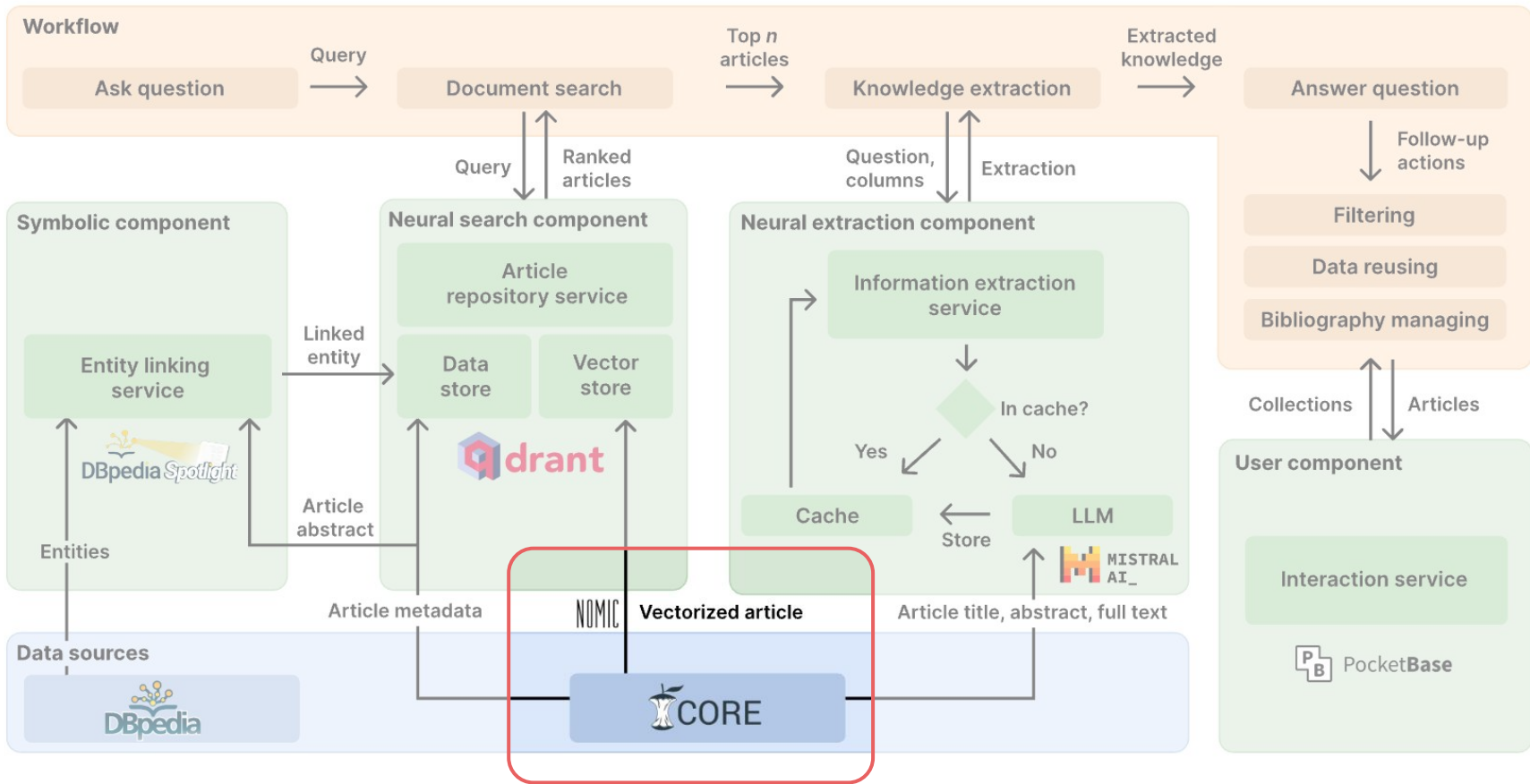
LLMs



Embeddings



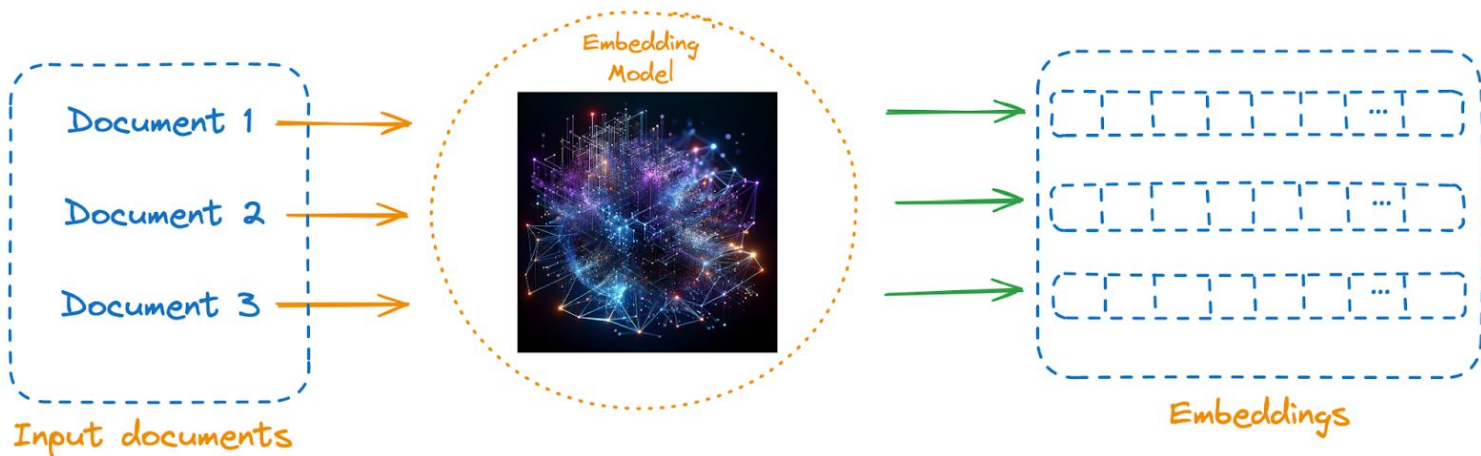
Semantic Search



f_x Embeddings

ORKG Ask backend uses:

- **Nomic** embedding models - **8K** context - **768** dimensions





Caching Responses



RAG



Technologies



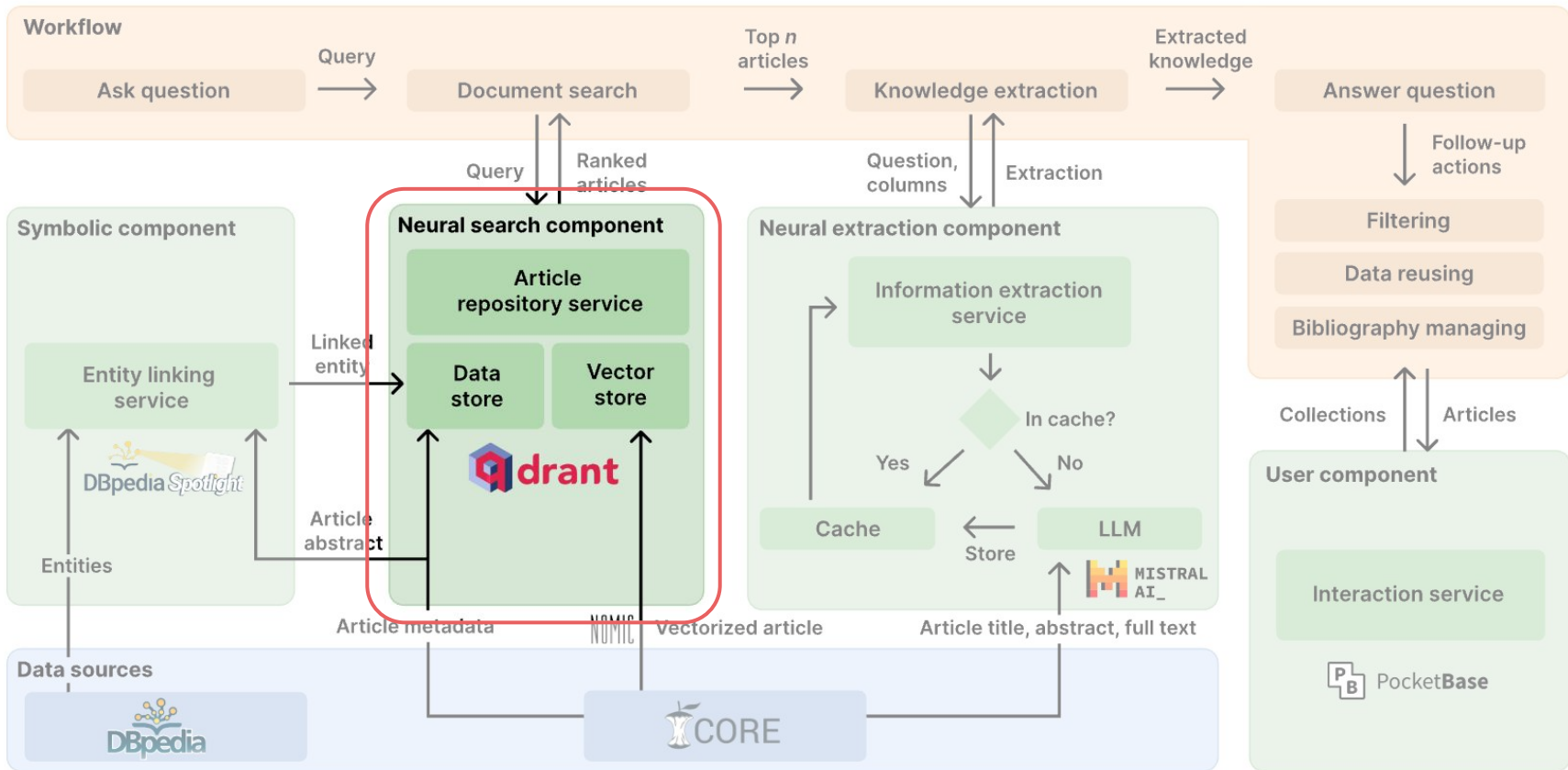
LLMs



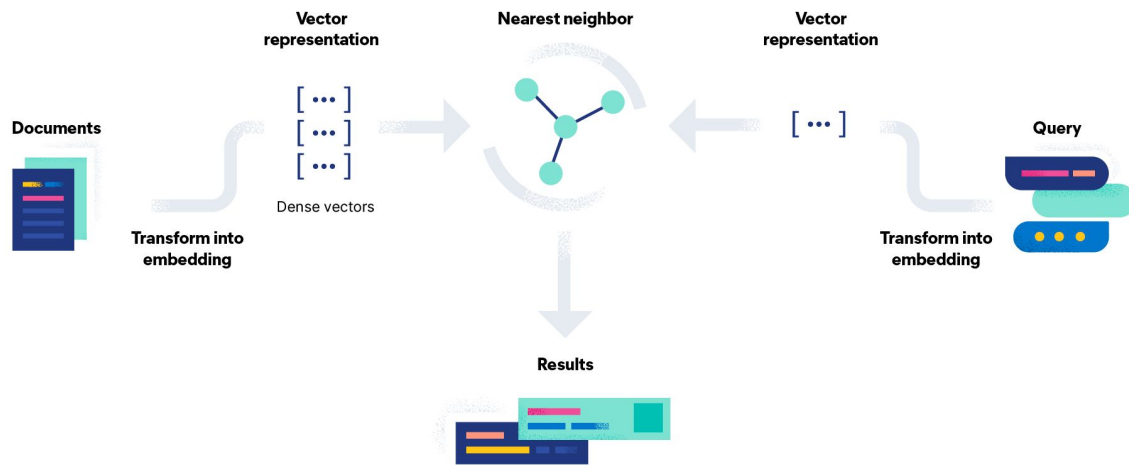
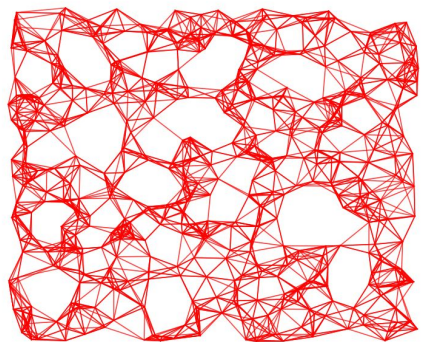
Embeddings



Semantic Search

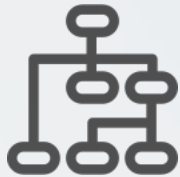


Qdrant vector database supporting filters





Caching Responses



RAG



Technologies



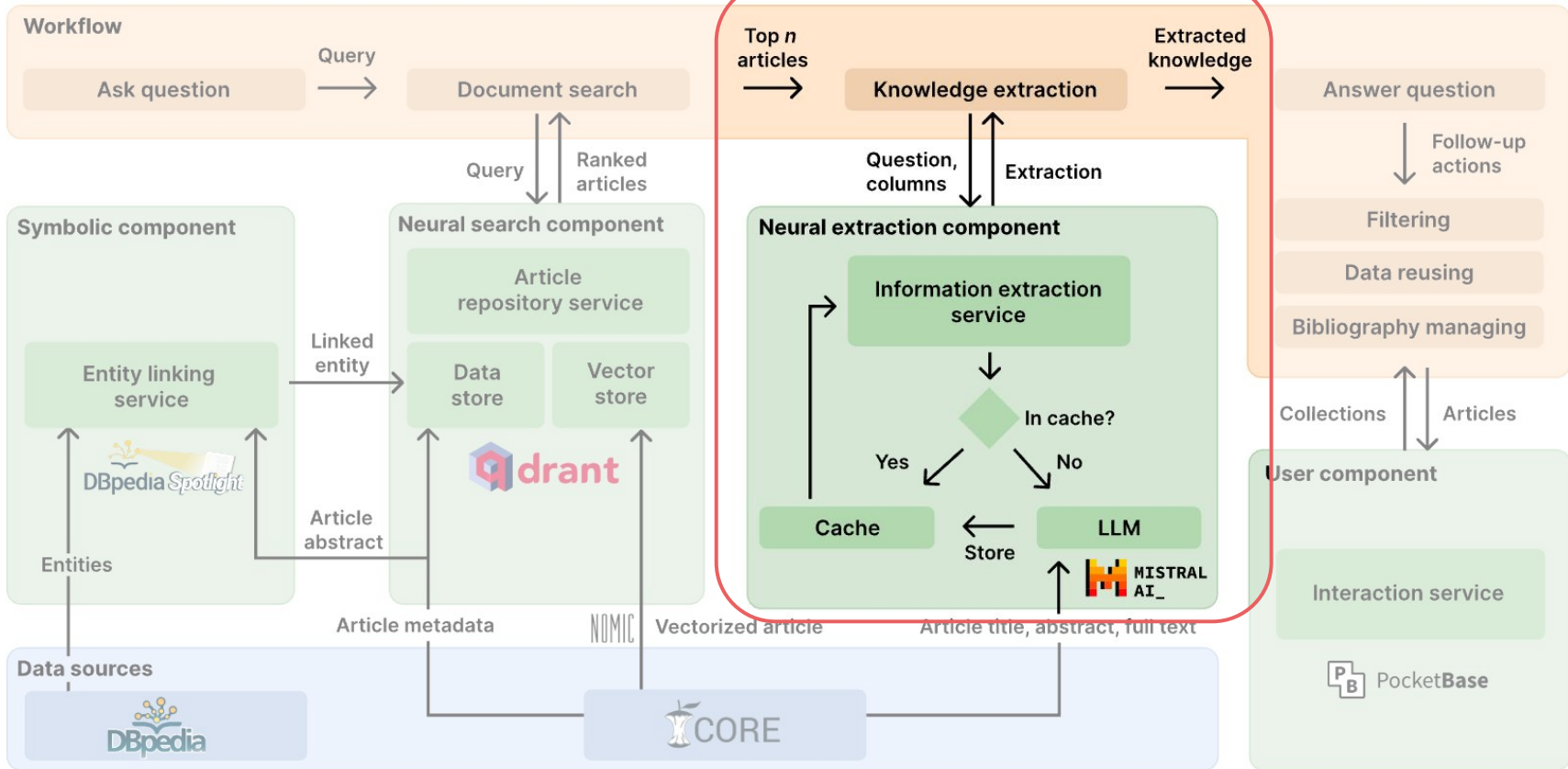
LLMs



Embeddings

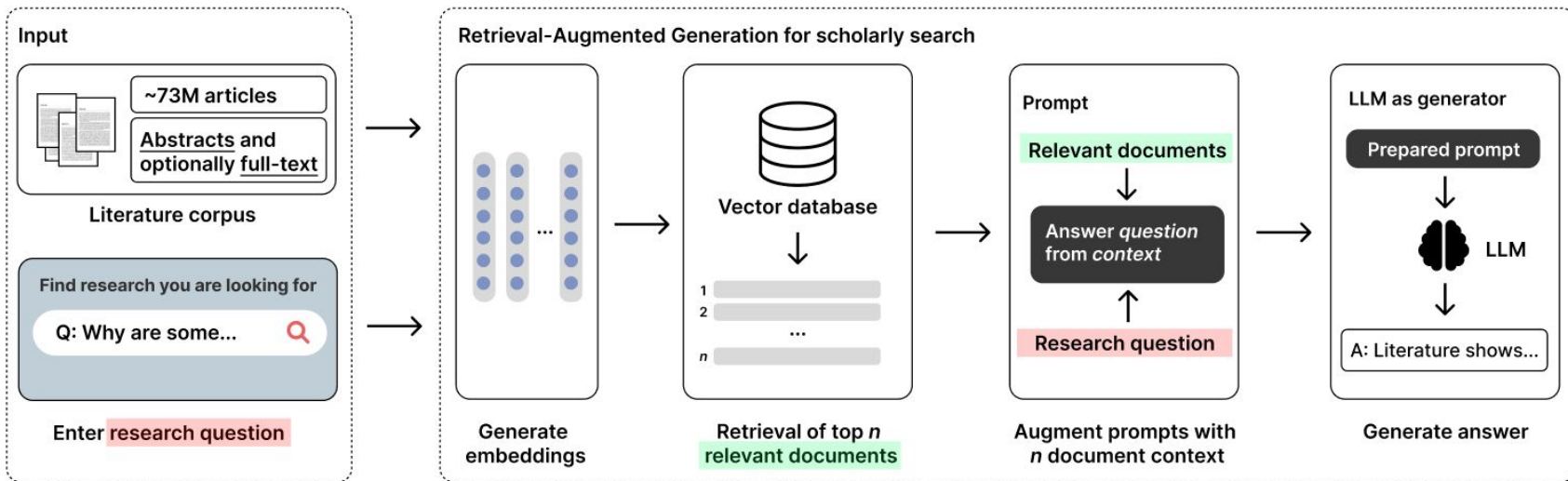


Semantic Search





RAG (Retrieval-Augmented Generation)





Caching Responses



State Machines



Technologies



LLMs



Embeddings



Semantic Search



Large Language Models (LLMs)

- ORKG Ask uses the following LLM
 - Mistral **v0.2** (Instruct) **7B**
- Hardware
 - The server is running with 1TB of memory RAM, 15TBs of SSD storage, 128 CPU cores, and seven GPU cards (Nvidia L4 4x24GB, Nvidia L40s 2x46GB, and Nvidia H100 1x82GB)



Large Language Models (LLMs)

- Information extraction prompt



```
You are an analysis-support bot that operates on scholarly documents and follows instructions.
You will get as an input: the research paper content and a set of properties/criteria to look for.
You will extract the values corresponding to the list of provided predicates.
Limit the values to only the content without prefixing it with the paper contains or the text says.
Your output should ALWAYS be like this:
```

```
<extraction><key>PROPERTY</key><value>VALUE</value></extraction>
```

```
Avoid lengthy values (one sentence MAX), rather split them into multiple values.
```

```
If the property contain multiple values, then your output MUST be like this:
```

```
<extraction><key>PROPERTY</key><values><value>VALUE1</value><value>VALUE2</value></values></extraction>
```

```
If you DO NOT find the value in the content then your output MUST BE THIS:
```

```
<extraction><key>PROPERTY</key><value>UNKNOWN</value></extraction>
```

```
If you have multiple properties to extract, then you should have multiple <extraction> tags.
```

```
Also, if the property is a question, write it down AS IS, WITHOUT any changes to the text.
```

```
AVOID extracting any extra properties or values in the output, focus only on the given properties.
```



Large Language Models (LLMs)

- Answer synthesis prompt



```
You are an analysis-support bot of scholarly documents that follows instructions.  
You will generate a comprehensive answer to the given research question (but no more than three/four  
sentences)  
solely based on the content provided.  
Cite the number of the content referenced for each claim like this:  
[1] for a single reference or [2][3] for multiple references.  
Emphasize brevity, focusing on essential details and omitting unnecessary information.  
Avoid adding the question in the answer and Do not include any notes or comments.
```




Caching Responses



LLMs



Embeddings



State Machines



Semantic Search

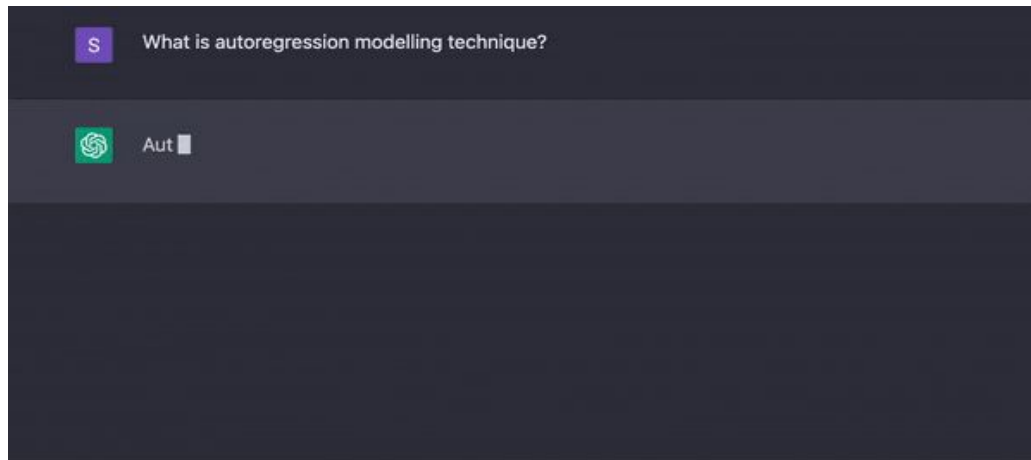


Technologies



Caching Responses

NFR5: Performance



- LLM replies have a high latency
- “Smart” caching implemented
- Cache invalidation possible
- Caching smallest components

Why is nature beneficial? The role of connec

Mayer, F. Stephan Regenerate cell content

- Exposure to nature increases connectedness to nature, attentional capacity, positive emotions, and ability to reflect on



The study underlying being effective of laboratory



Caching Responses



State Machines



LLMs



Embeddings



Semantic Search



Technologies



Technologies



Text Embeddings Inference



Outline

- Recap
- Introduction to ORKG Ask
- Frontend
 - Features
 - Best practices for writing research applications
- Backend
 - RAG approach
 - LLM + Prompts
- **Evaluation**

Evaluation

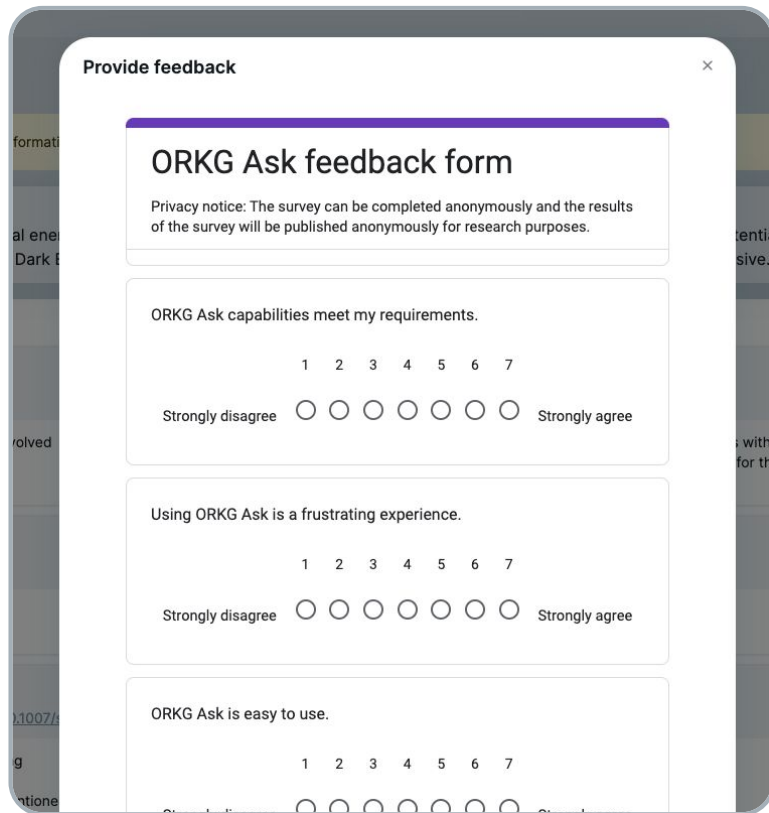
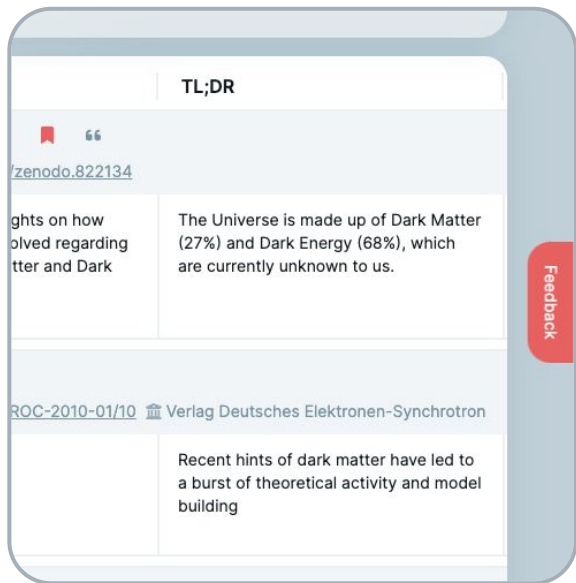
- **ORKG Ask** is being operated as a production service, meaning we have actual users to collect analytics data, and request feedback
- User feedback is **crucial** to further improve products and services
- I will now discuss:
 - Operational feedback
 - Question classification
 - Analytics/usage data

Disclaimer: these are early and unverified results, partially collected and classified automatically.
Please consider this when looking at the data.

Operational feedback

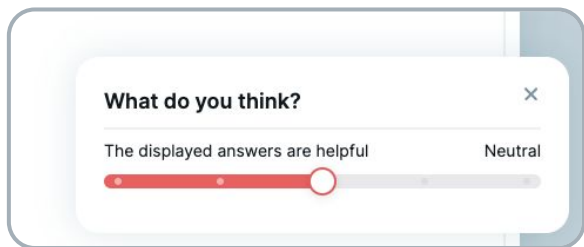
- Collect both **question feedback** and **system feedback** from actual users
- Providing feedback must be as **effortless as possible** to convince users to provide feedback
- Outcomes should provide an indication of usability and answer usefulness

Operational feedback - Original design



Operational feedback - Updated design

- Feedback widget shows after 10 seconds on the results page
- Additional questions only display when the first question is answered

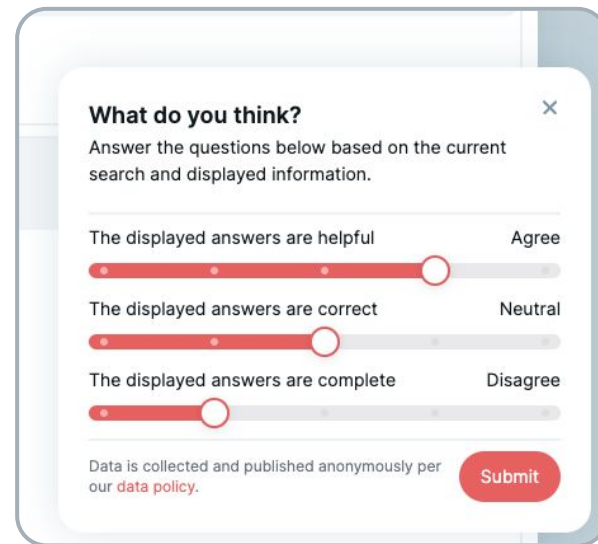


What do you think? ×

The displayed answers are helpful Neutral

A horizontal slider with a red bar and a white circle marker is positioned at the 'Neutral' mark.

Question specific feedback



What do you think? ×

Answer the questions below based on the current search and displayed information.

The displayed answers are helpful Agree

The displayed answers are correct Neutral

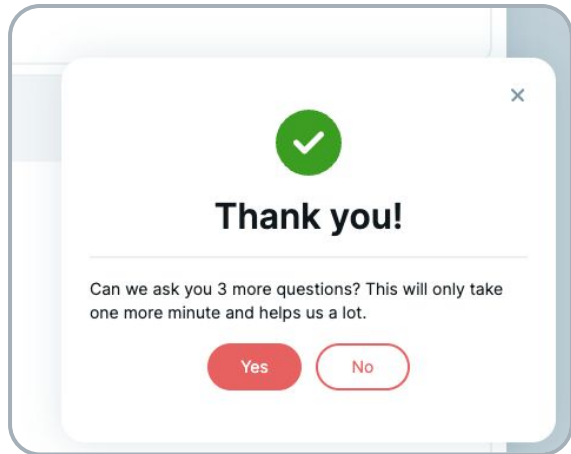
The displayed answers are complete Disagree

Data is collected and published anonymously per our [data policy](#).

Submit

Operational feedback - Updated design

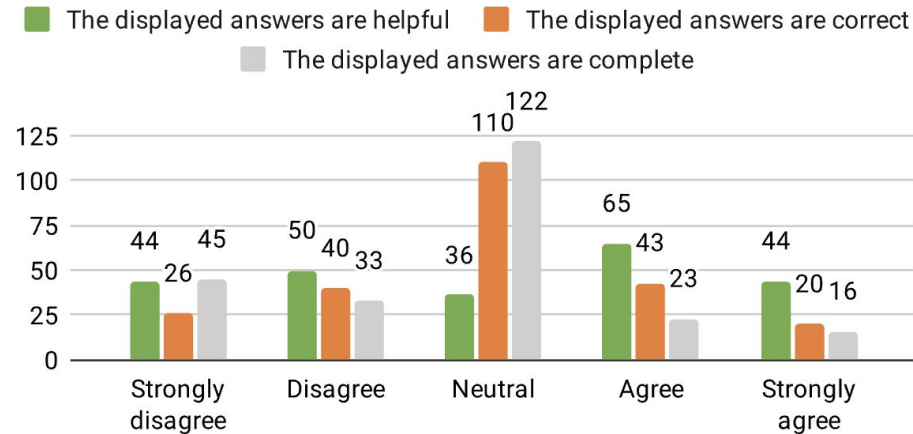
- General system feedback is collected as a follow-up question (users are asked in a friendly manner to fill out more questions)



A screenshot of a feedback form titled "What do you think?" with a close "x" button in the top right. The form asks "How satisfied are you with ORKG Ask?" and provides a scale of five smiley faces from a sad face to a happy face, with "Very dissatisfied" and "Very satisfied" labels. Below this, there are two Likert scale questions: "ORKG Ask's capabilities meet my requirements" and "ORKG Ask is easy to use". Each question has a 7-point scale with radio buttons and labels "Strongly disagree" and "Strongly agree". At the bottom, there are two red buttons: "Add more comments" and "Submit".

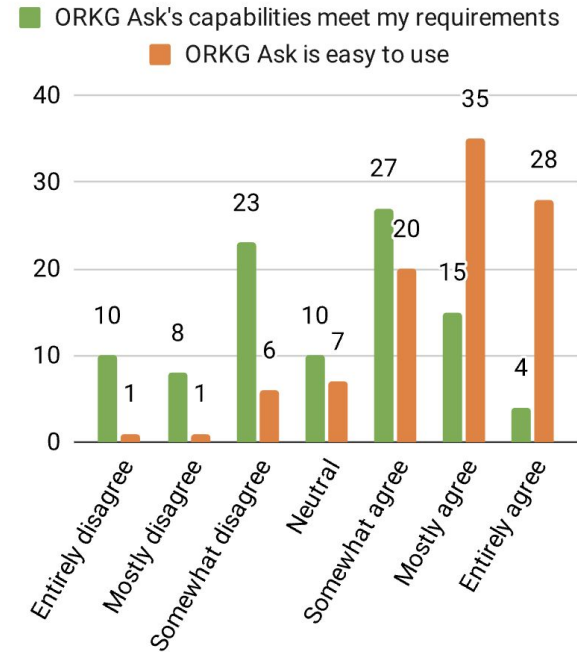
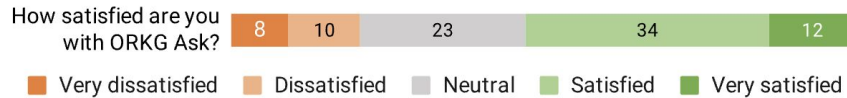
Operational feedback - Results

- Question specific feedback
- Important to track the results over time, as better performing models are deployed



Operational feedback - Results

- The system is indeed easy-to-use, but does not always meet the user's requirements



Question classification

- Determine how the system is being used, to further guide development efforts
- As can be seen, a large number of questions is not formatted as expected, meaning that it is less likely the system is able to provide helpful answers

Disclaimer: these are early and unverified results, partially collected and classified automatically. Please consider this when looking at the data.

General	
Questions in English	87.97%
Correctly formatted	62.03%
Reasonable scientific question	89.24%
Complex question	37.97%
Context-dependent	33.54%
Non-ambiguous	63.92%
Domain	
Life Sciences	15.19%
Natural Sciences	19.62%
Engineering Sciences	23.42%
Humanities and Social Sciences	37.97%
Other	3.16%
Type	
Descriptive	60.13%
Opinion-based	1.90%
Fact-based	25.95%
Numerical	0.00%
Comparative	4.43%
Other	6.96%

Statistics and system usage

- Measured over a period of ~2 months
- Service is indeed being used on other devices than desktops
- Events show how often certain feature are used, conclusions could be:
 - Feature is not adding value
 - Feature is difficult to use
 - Feature is hidden

Analytics	
Visits	10,360
Returning visits	5,494
Pageviews	36,406
Average visit duration	6:45
Bounce rate	3%

Device usage	
Desktop	76,9%
Smartphone	20,7%
Other	2,4%

Events	
Questions asked	17,078
Downloads	794
Outlinks	2,354
Custom filters added	142
Custom columns added	121
Load more (1 page)	1,331
Load more (2 pages)	586
Load more (3 pages)	318
Load more (>3 pages)	938

Limitations

- Quality of results heavily depends on dataset
 - Is the full-text available?
 - Are there linked sources of the content available?
 - Is the article itself reliable?
- Articles without abstracts are excluded from the dataset
- ORKG Ask is first and foremost a scholarly search system, and secondary a Q/A system
- Semantic filtering is in an early stage

Demo

ask.orkg.org



YES, YOU CAN TRY IT YOURSELF AS WELL!

Thank you!

Any Questions?

Allard Oelen

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[linkedin.com/in/allard-oelen](https://www.linkedin.com/in/allard-oelen)

Meet the team:

<https://orkg.org/about/9/Team>