

AI-Supported Scholarly Research with ORKG Ask and TIB AIssistant



Leibniz ScienceCampus
**Digital Transformation
of Research**

Allard Oelen¹

Session moderator: Anna Jacyszyn²

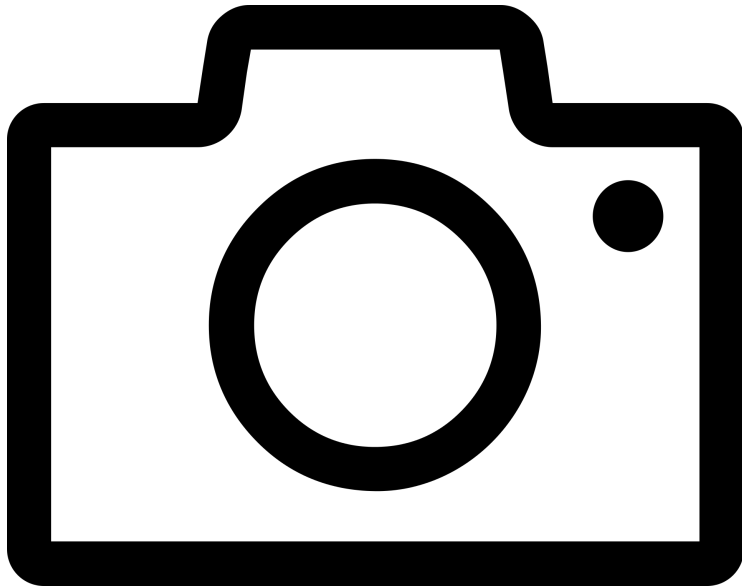
(1) TIB - Leibniz Information Centre for Science and Technology and University Library, Leibniz University Hannover

(2) FIZ Karlsruhe - Leibniz Institute for Information Infrastructure



Interdisciplinary Colloquium on Digitalisation of Research, FIZ Karlsruhe, 2 October 2025

Photos and recording



Pixabay, ste_phania



2nd of October 2025 | 11:00 - 12:00

Interdisciplinary Colloquium on Digitalisation of Research

AI-Supported Scholarly Research with ORKG Ask and TIB Alssistant



Allard Oelen

TIB - Leibniz Information Centre for Science and
Technology and University Library, Leibniz University
Hannover

- Introducing ORKG Ask, a scholarly search and exploration platform
- Introducing TIB Alssistant, a platform for an AI-supported research assistant
- The use of AI and LLMs in ORKG Ask and TIB Alssistant

AI-Supported Scholarly Research with ORKG Ask and TIB Alssistant

Allard Oelen

TIB Leibniz Information Centre for Science and Technology, Hannover, Germany

Today's outline

- Introduction to scholarly communication
- ORKG Ask
- TIB Alssistant

30 mins

- Q&A

Today's outline

- Introduction to scholarly communication
- ORKG Ask
- TIB Alssistant

30 mins

- Q&A

Traditional scholarly search systems

- **Keyword-based search** standard to find scholarly articles

Research question:

*How does climate change
influence biodiversity in polar
and alpine ecosystems?*

Search query

Traditional scholarly search systems

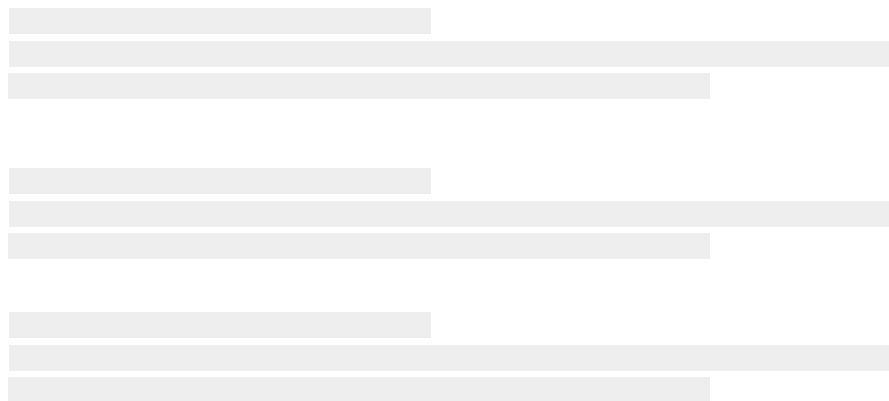
- **Keyword-based search** standard to find scholarly articles

Research question:

How does climate change influence biodiversity in polar and alpine ecosystems?

Search query

climate change AND biodiversity AND ecosystems AND ...



Traditional scholarly search systems

- **Keyword-based search** standard to find scholarly articles

Problem:
Nuances of the original information
need are lost...

Problem:
Takes a lot of time to see whether the
listed articles are indeed relevant...

Problem:
... and at the end the original research
question is still not answered

Search query

climate change AND biodiversity AND ecosystems AND ...

[Redacted search results]

[Redacted search results]

[Redacted search results]

Traditional scholarly search systems

- **Keyword-based search** standard to find scholarly articles

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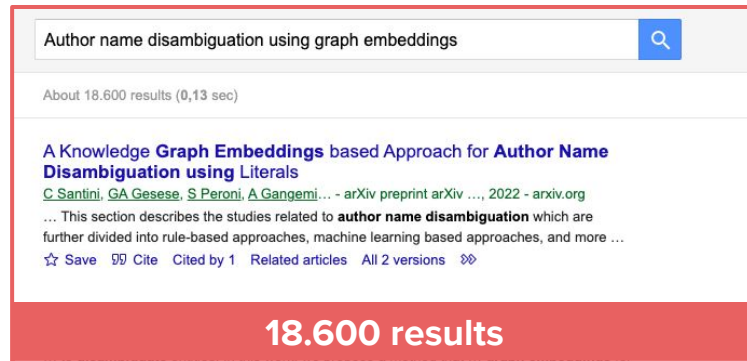
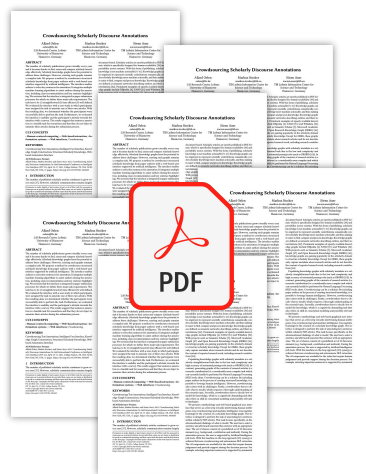
Search query

climate change AND biodiversity AND ecosystems AND ...

Solution:
Use AI to support researchers in the
process of literature search

Scholarly communication

- Scholarly knowledge is communicated in **narrative document-based** forms
- Lacking **machine-actionability**: cumbersome for machines to parse the content



Information need: **“Author name disambiguation”**
approaches leveraging **“graph embeddings”**

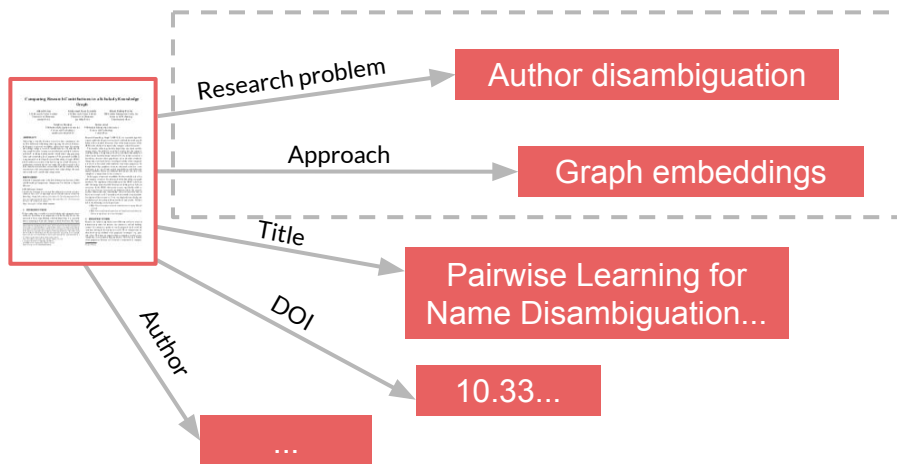
Structured vs. unstructured data



ORKG

orkg.org

Select by “**Research problem**” and “**Approach**”



Today's outline

- Introduction to scholarly communication
- **ORKG Ask**
- TIB Alssistant

30 mins

- Q&A

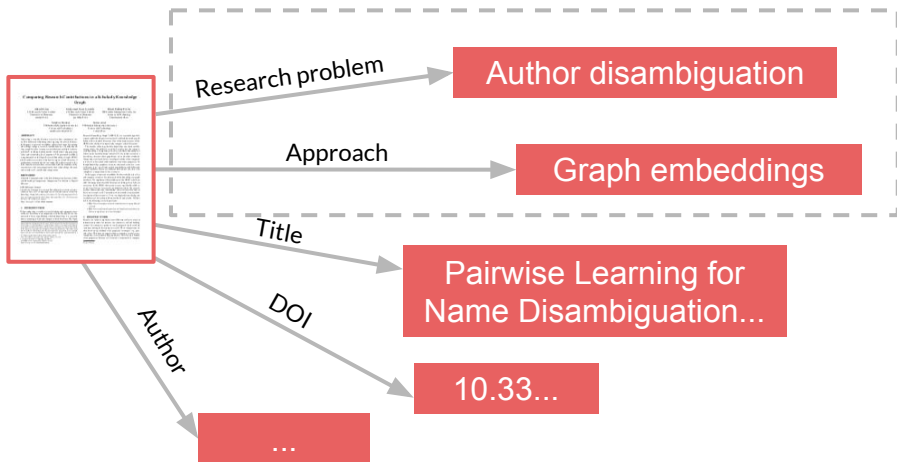
Structured vs. unstructured data



ORKG

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Select by “**Research problem**” and “**Approach**”

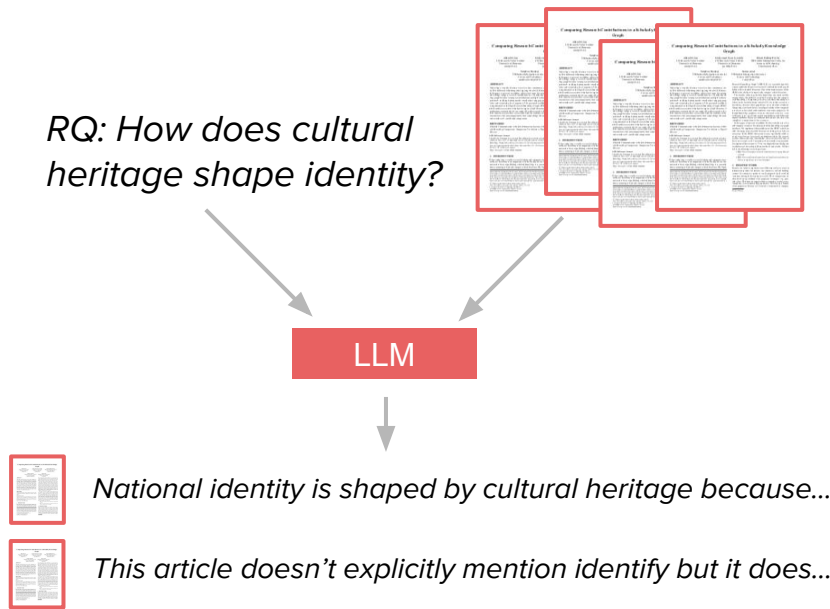


ORKG

Ask

ask.orkg.org

RQ: How does cultural heritage shape identity?



National identity is shaped by cultural heritage because...

This article doesn't explicitly mention identity but it does...

Structured vs. unstructured data



ORKG

orkg.org

Select by “**Research problem**” and “**Approach**”

Research problem

Author disambiguation

Approach

Graph embeddings

Title

Pairwise Learning for
Name Disambiguation...

DOI

10.33...

Author

...



ORKG

Ask

ask.orkg.org

*RQ: How does cultural
heritage shape identity?*

LLM

National identity is shaped by cultural heritage because...

This article *doesn't* explicitly mention *identify* but it does...

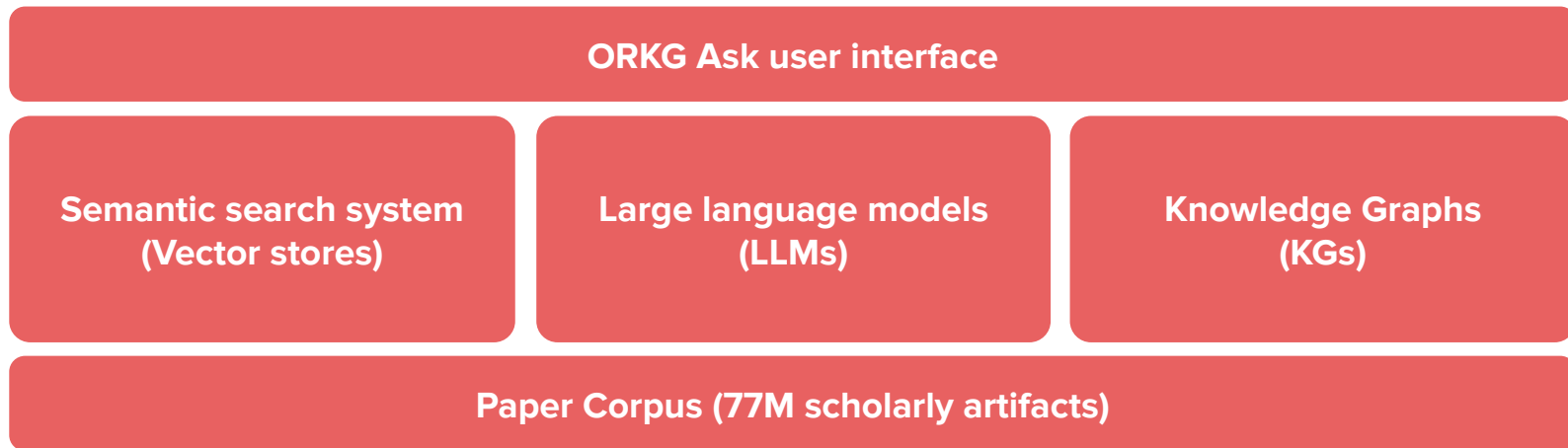
Approach: ORKG Ask (Assistant for Scientific Knowledge)

- Objective: provide a **scholarly search system** that finds related literature for a specific **research question** → Open source, reproducible and transparent
- High level system **architecture**:



Approach: ORKG Ask (Assistant for Scientific Knowledge)

- Objective: provide a **scholarly search system** that finds related literature for a specific **research question** → Open source, reproducible and transparent
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Search

My library



Save

Share

Hidden

CSV

ORKG

Edit columns

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

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.



Question answering



Reference
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Filtering



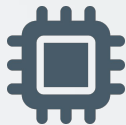
Custom
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Reproducibility



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Reproducibility

? 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 laborator
--	---

Paper-based answer

Answer (based on top 5 papers)

Exposure to nature, as shown in multiple studies, 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



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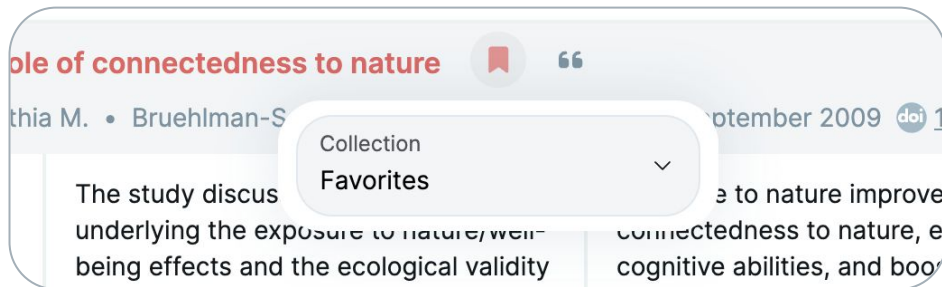
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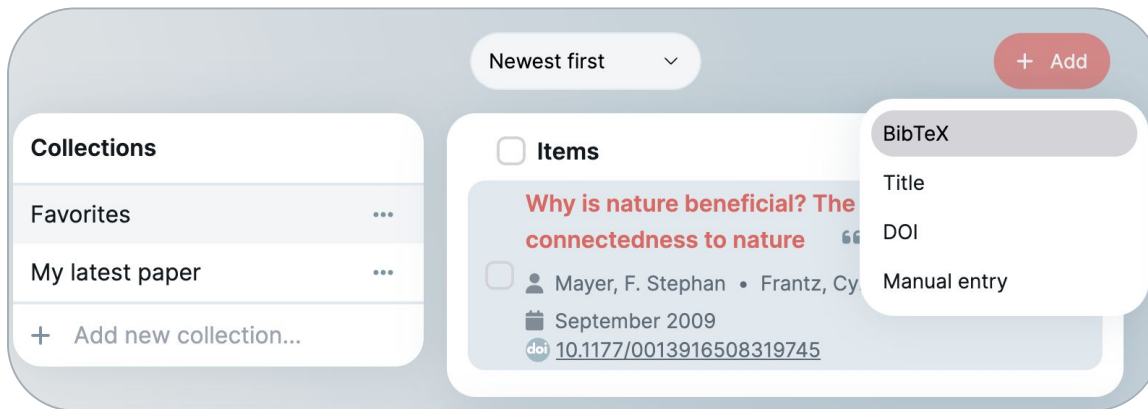
Reproducibility

“ Reference manager

Add papers to
My library



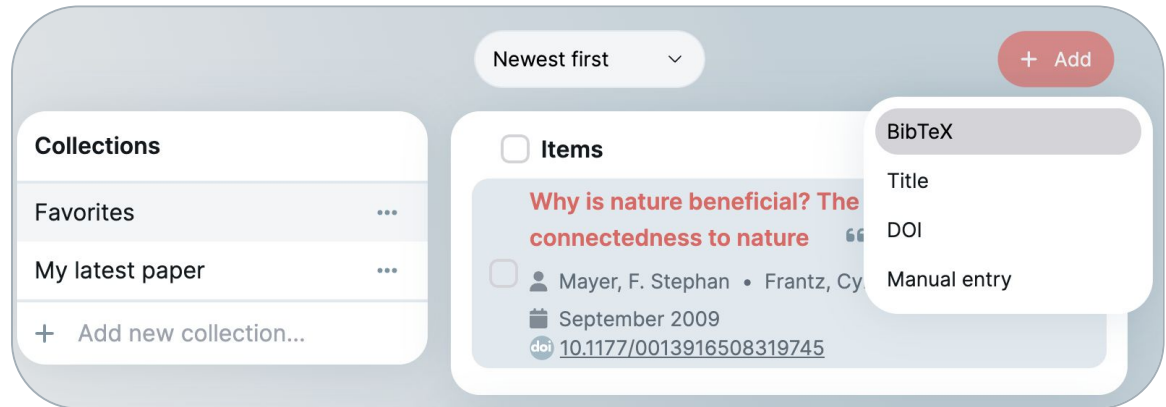
Add additional
entries, or upload
your entire
bibliography



“ Reference manager

Reference manager

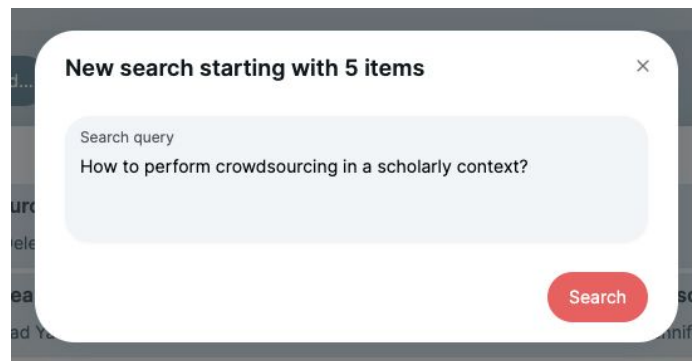
Import existing bibliographies



“ Reference manager

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Extraction information from
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Question answering



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Reproducibility

Filtering

Filters

Year

1950 till 2024

Reset

Language

Search...

☐ Afar

☐ Abkhazian

☐ Avestan

☐ Afrikaans

☐ Akan

Use the default filters

Abstract (1)

Contains mental health ×

Add filter...

Field*
Abstract ▾

Contains ▾ outdoors

Add

Or create custom filters

Filtering - By topic

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



Mentions

 Finland
Place

 New York Times
Daily newspaper

 International
Public company

 Planetary boundary layer
Thing

 SDGs
Classification scheme

Or explore topics per paper



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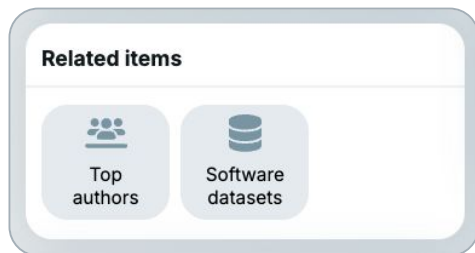
Dark mode



Reproducibility

Related software and datasets

Federated search, for now, via Resodate and Wikidata



Related software and datasets

Software and datasets related to your research question are coming from the following sources:

 RESODATE  WIKIDATA

Cultural diversity

Innovation

Creativity

Creative cognition: A multidisciplinary and integrative framework of creative thinking

Dataset Resodate

Extant research provides vast information on antecedents to creativity. However, creative thinking is oftentimes treated as a black box, requiring input and producing creative output. Cognitive processes occurring during creative thinking tend to be neglected,...

Read more

creativity

Dataset Wikidata

Creativity

Dataset Wikidata

Continue in Resodate

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Top authors



Top authors are paper authors collected from the top 50 relevant articles. You can use this list to find domain experts for your research questions. Author data provided by [OpenAlex](#).

AUTHOR NAME	AFFILIATION	NUMBER OF PAPERS
John Doe 	Affiliation	4
Jane Doe 	Affiliation 2	3
Max Mustermann	Affiliation 3	2

Find experts for specific research questions



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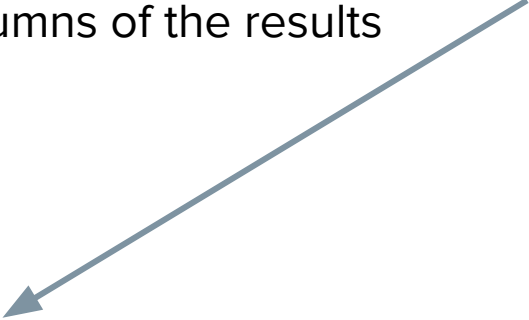
Dark mode



Reproducibility

Custom extraction

Extract additional knowledge by changing the columns of the results table



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

 Edit columns

Selected columns

 Answer 

 Insights 

 TL;DR 

 Conclusions 

 Results 

 Methods 

 Limitations 

 Add new column...



Question answering



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Reproducibility



Saved searches

Save searches and make them part of your research workflow

Retrieve previously saved searches

Save search



Title

How does exposure to nature affect overall health and w

Save

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



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Saved searches



Export



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Reproducibility

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



Hidden



CSV



ORKG

Export results to CSV

APA



Vancouver

Harvard

BibTeX

RIS

CLS JSON

Export papers



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Saved searches



Export



Latest technologies

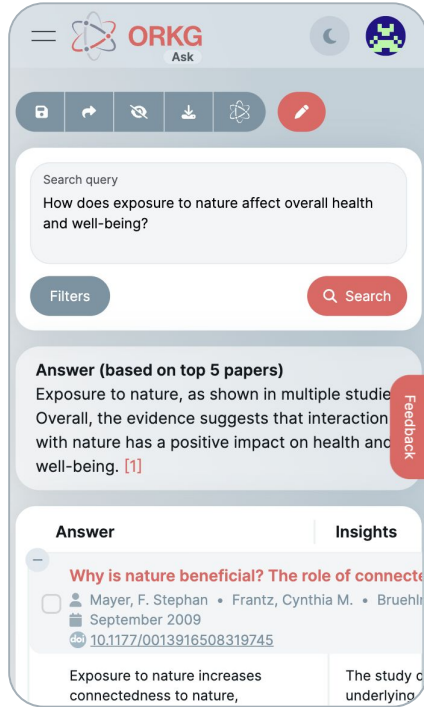
Responsive

Dark mode

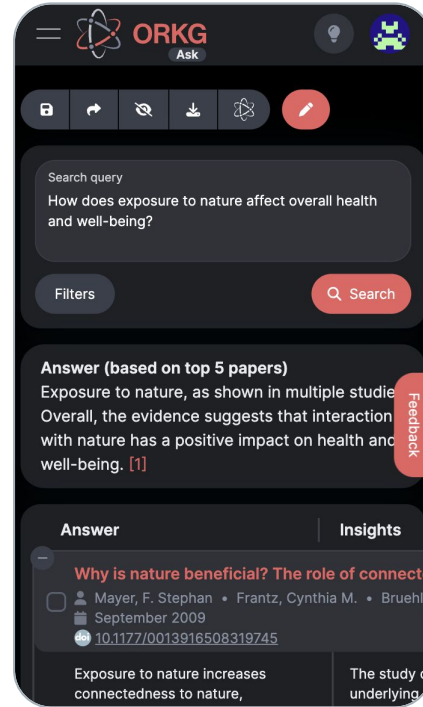


Reproducibility

Responsive & Dark mode



Fully responsive



Dark mode



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extraction



Saved searches



Export



Latest technologies

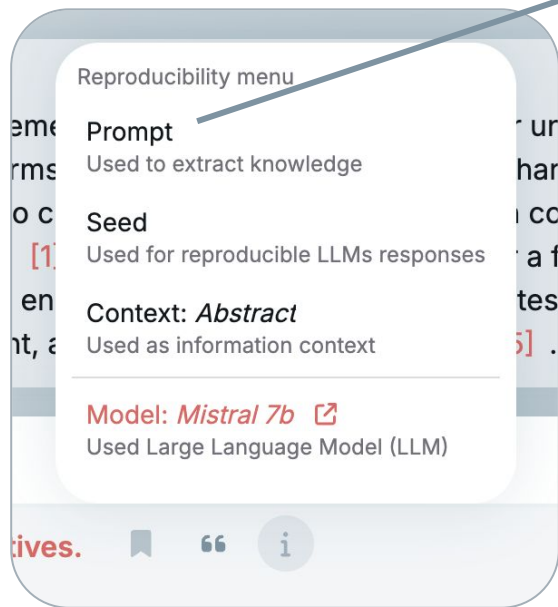
Responsive

Dark mode



Reproducibility

Reproducibility



Reproducibility dropdown

Prompt

System prompt

[Download](#) [Copy](#)

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>
```

User prompt

☐ Show context

[Download](#) [Copy](#)

```
## properties
{properties placeholder}.
## paper content
{content placeholder}.
```



Question answering



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Filtering



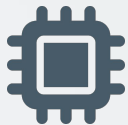
Custom
extraction



Saved searches



Export



Latest technologies

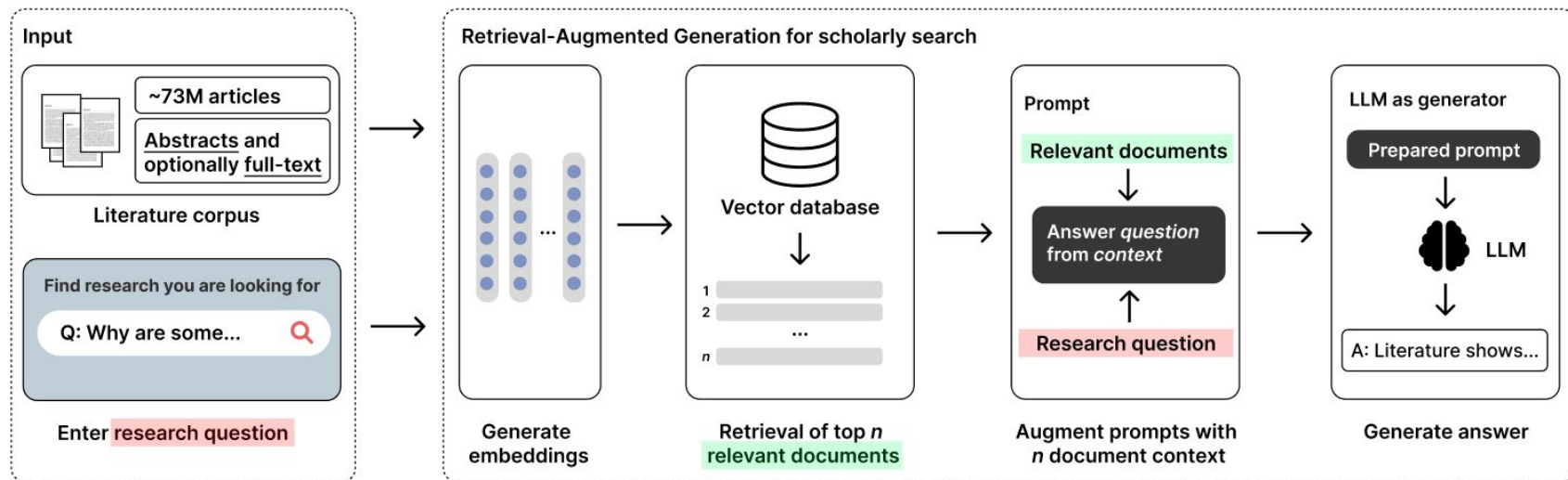
Responsive

Dark mode



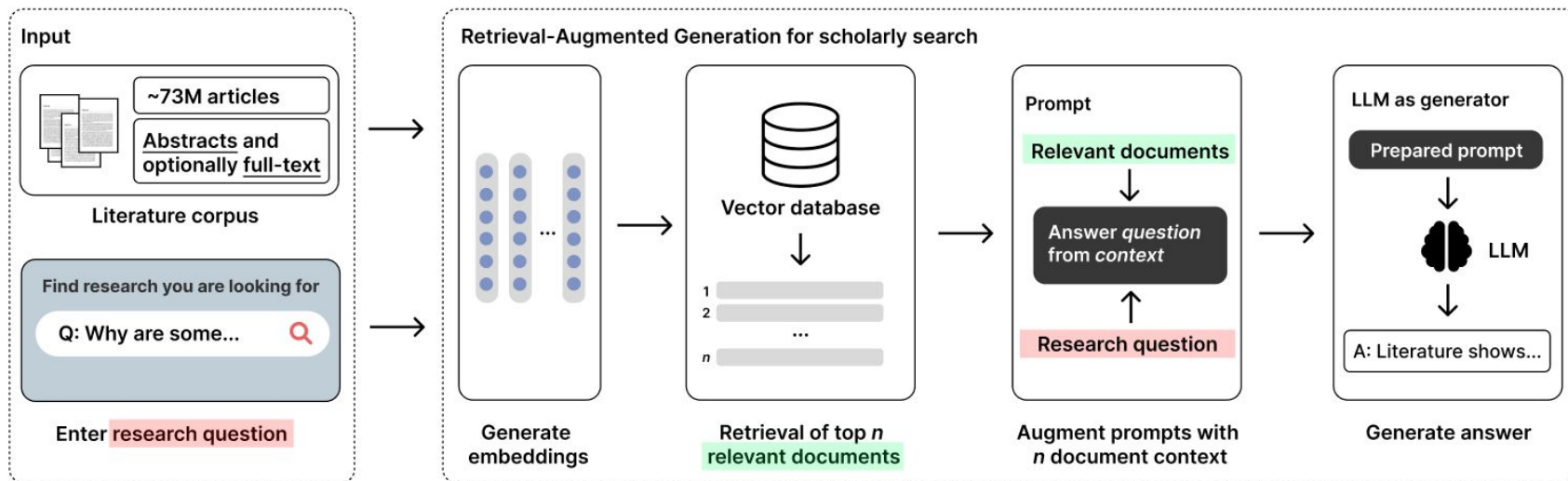
Reproducibility

Latest technologies





Latest technologies



- The server is running with
 - 1TB of memory RAM
 - 15TBs of SSD storage
 - 128 CPU cores
 - 7 GPU cards: Nvidia L4 4x24GB, Nvidia L40s 2x46GB, Nvidia H100 1x82GB

- ORKG Ask uses Mistral **v0.2** (Instruct) **7B**

ask.orkg.org



YES, YOU CAN TRY IT YOURSELF AS WELL!

Today's outline

- Introduction to scholarly communication
- ORKG Ask
- **TIB Alssistant**

30 mins

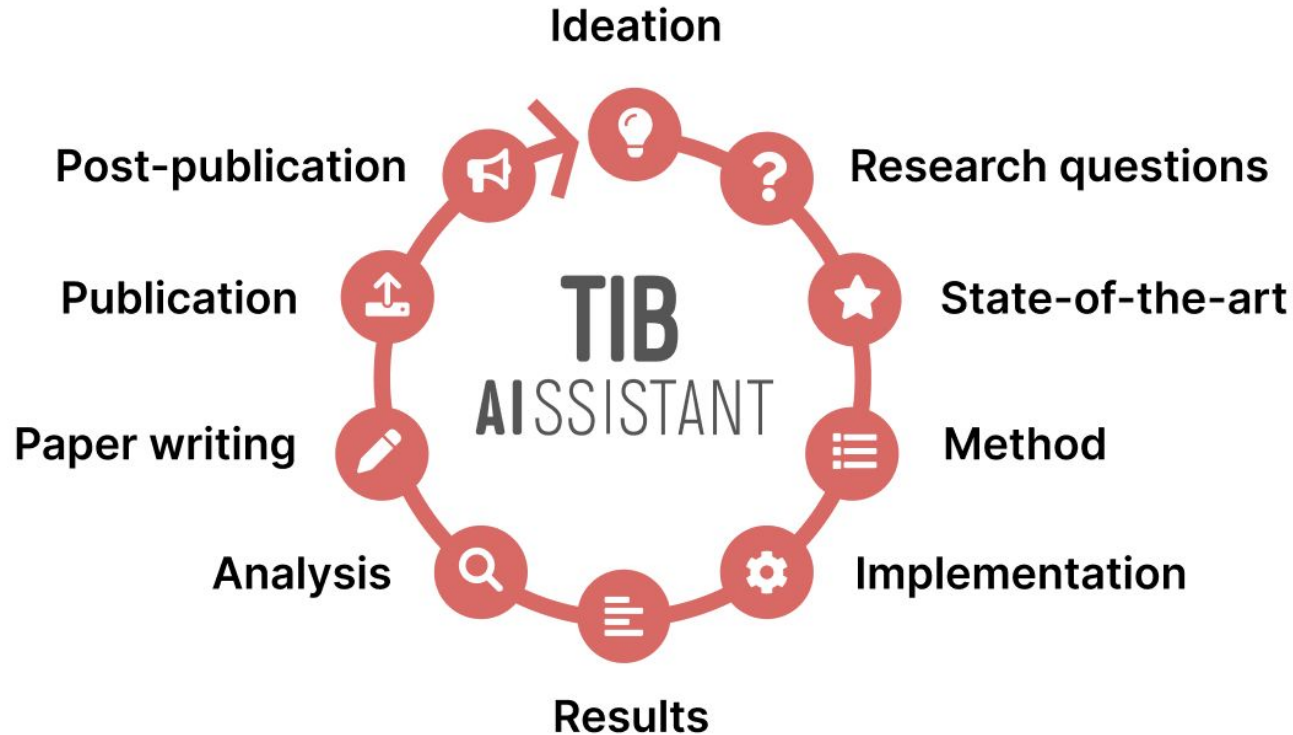
- Q&A

TIB Alssistant

- An AI-supported research assistant helping **throughout the research life cycle**
- Integrated Development Environment (IDE)
- Modular, flexible, domain-agnostic



TIB AIssistant



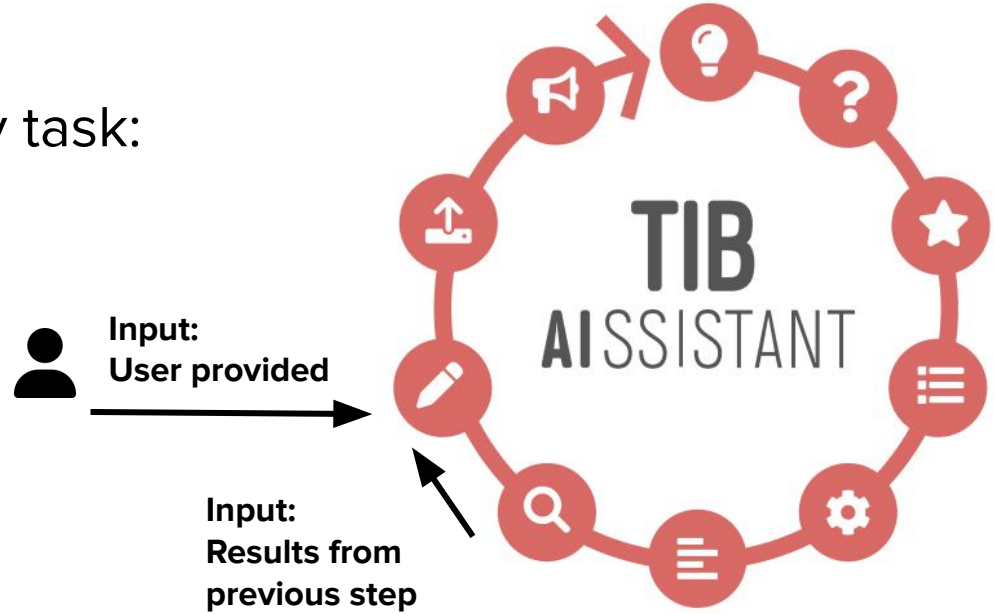
TIB Alssistant

- General user interaction by task:
 - a. Assistants
 - b. Default set of tools
 - c. Assets
 - Input
 - Output
- Each phase can be used in isolation or in sequence



TIB Alssistant

- General user interaction by task:
 - a. Assistants
 - b. Default set of tools
 - c. Assets
 - Input
 - Output
- Each phase can be used in isolation or in sequence



TIB AISSISTANT

Ideation

Research questions

Related literature

Method

Implementation

Results

Analysis

Paper writing

Review

Publication

Post-publication

Deactivated items coming soon

Reset all



Ideation chat



The ideation phase helps you to explore possibly interesting research avenues. This can be based on your already existing work, or based on new topics you like to explore further. [Read more.](#)

Assistant

Please provide some of your existing papers (e.g., PDF, DOI, or your ORCID) to serve as inspiration for the rest of the ideation.

The DOI is 10.1145/3670419

Crossref ➕

ORCID ➕

Here are relevant topics, select the ones you are interested in:

- ☐ HCI with machine learning
- ☐ Impact of machine learning on modern HCI systems

Type your message here



DOI

ORCID

PDF

Unpaywall

Tools

Assets

Output

Ideation topics 4



≡ HCI for machine learning for a world ×

≡ Lorem ipsum dolor sit amet ×

≡ Attention is all you need ×

≡ HCI for machine learning for a world ×

Add a topic...

Assets, input/output

TIB AISSISTANT

- Ideation**
- Research questions
- Related literature
- Method
- Implementation
- Results
- Analysis
- Paper writing
- Review
- Publication
- Post-publication

Deactivated items coming soon

Reset all



Ideation chat



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Please provide some of your existing papers (e.g., PDF, DOI, or your ORCID) to serve as inspiration for the rest of the ideation.

The DOI is 10.1145/3670419

Crossref

External tool calling

An external server hosted at **crossref.com** will be accessed. Please verify that you trust this server and ensure that no personal information is transmitted. The following data will be provided to the server:

Parameter

Value



doi

10.1145/3670419

By clicking "Continue", you declare no personal data is provided as per our [privacy policy](#).

Cancel

Continue

Type your message here



DOI

ORCID

PDF

Unpaywall

Tools

Assets

Output

Ideation topics 4



≡ HCI for machine learning for a world x

≡ Lorem ipsum dolor sit amet x

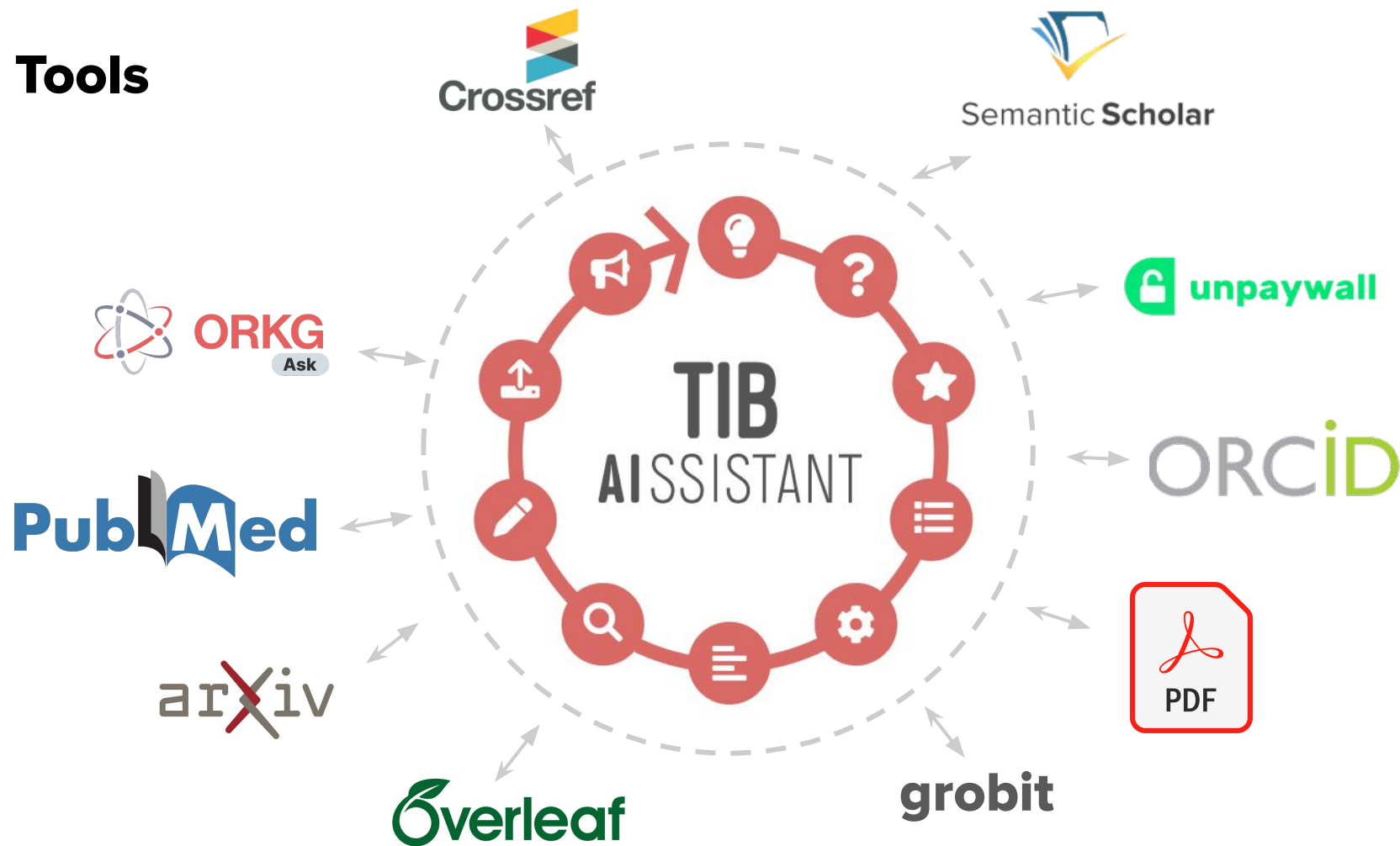
≡ Attention is all you need x

≡ HCI for machine learning for a world x

Add a topic...

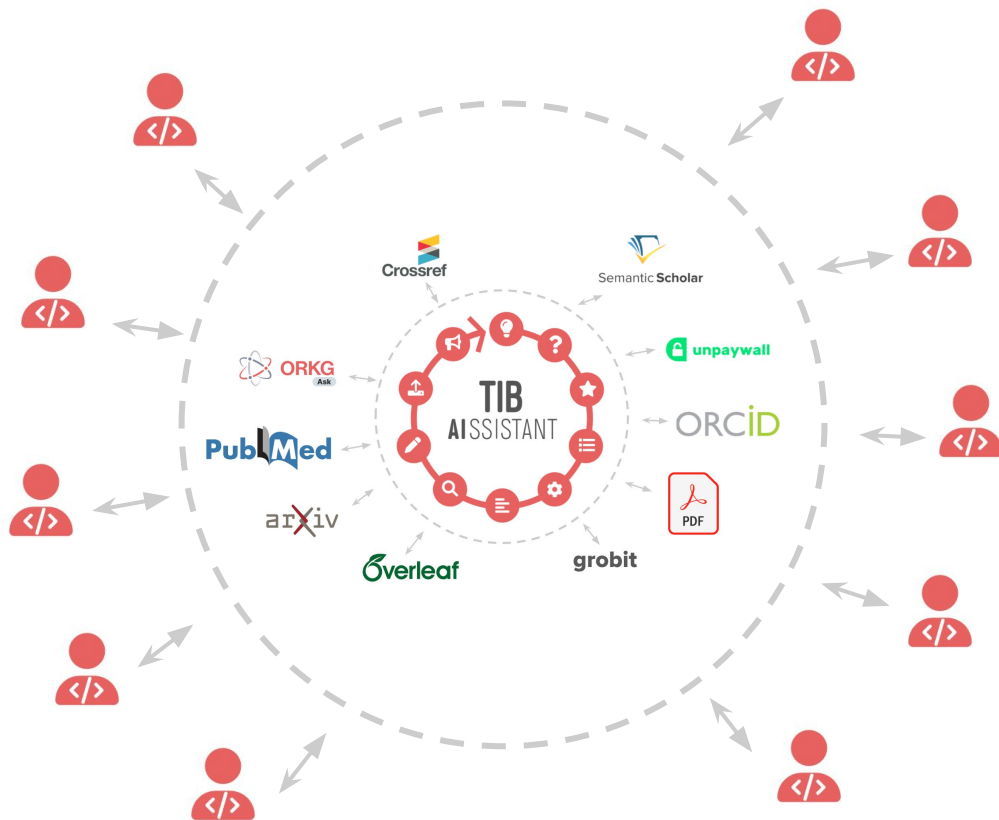
Assets, input/output

Tools



TIB Alssistant as platform

- **Initial implementation** shows how the platform can be used
- Everyone is **encouraged to contribute** → Create assistants, add tools, etc.
- Ensures you do **not have to start from scratch** when implementing research focused LLMs



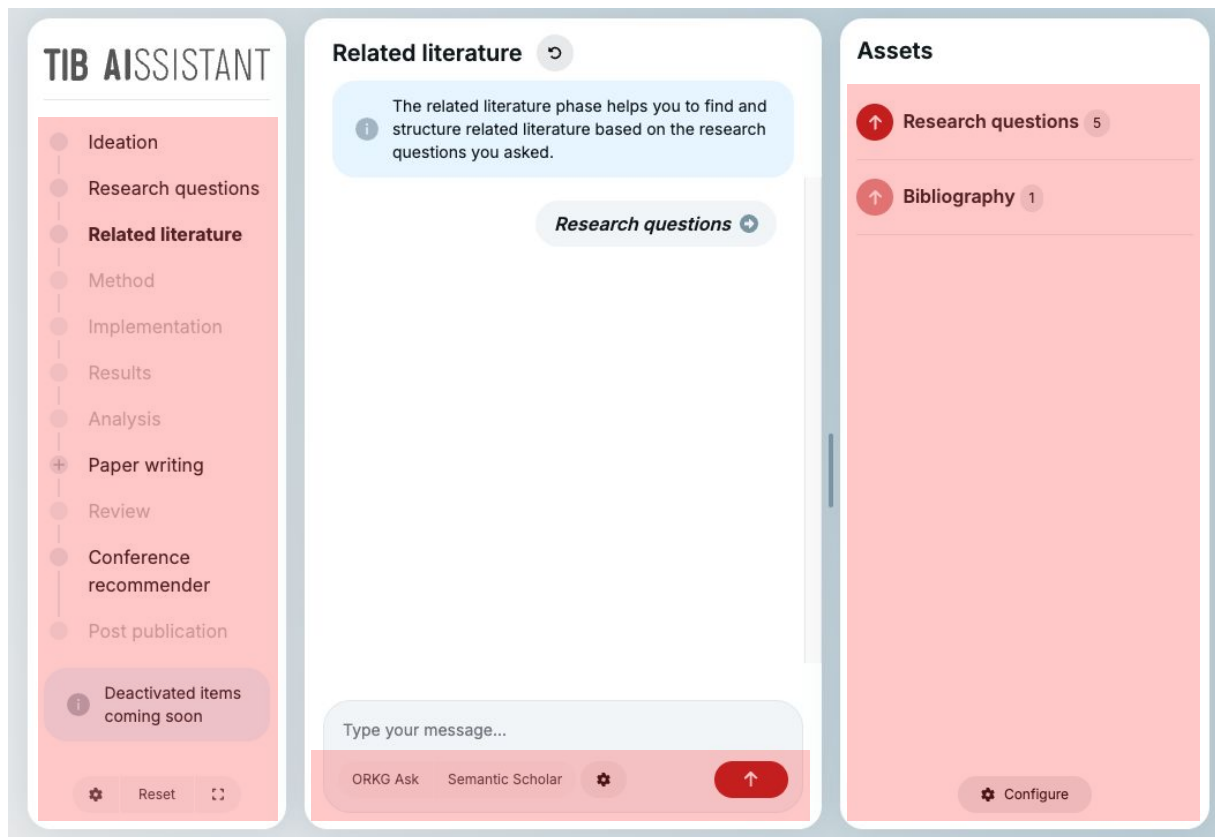
Configurability

The screenshot displays the TIB AISSISTANT interface, which is designed for configurability. It features a sidebar on the left with a vertical list of steps: Ideation, Research questions, **Related literature** (highlighted), Method, Implementation, Results, Analysis, Paper writing, Review, Conference recommender, and Post publication. Below this list is a section for 'Deactivated items coming soon'. At the bottom of the sidebar are icons for settings, a 'Reset' button, and a refresh icon.

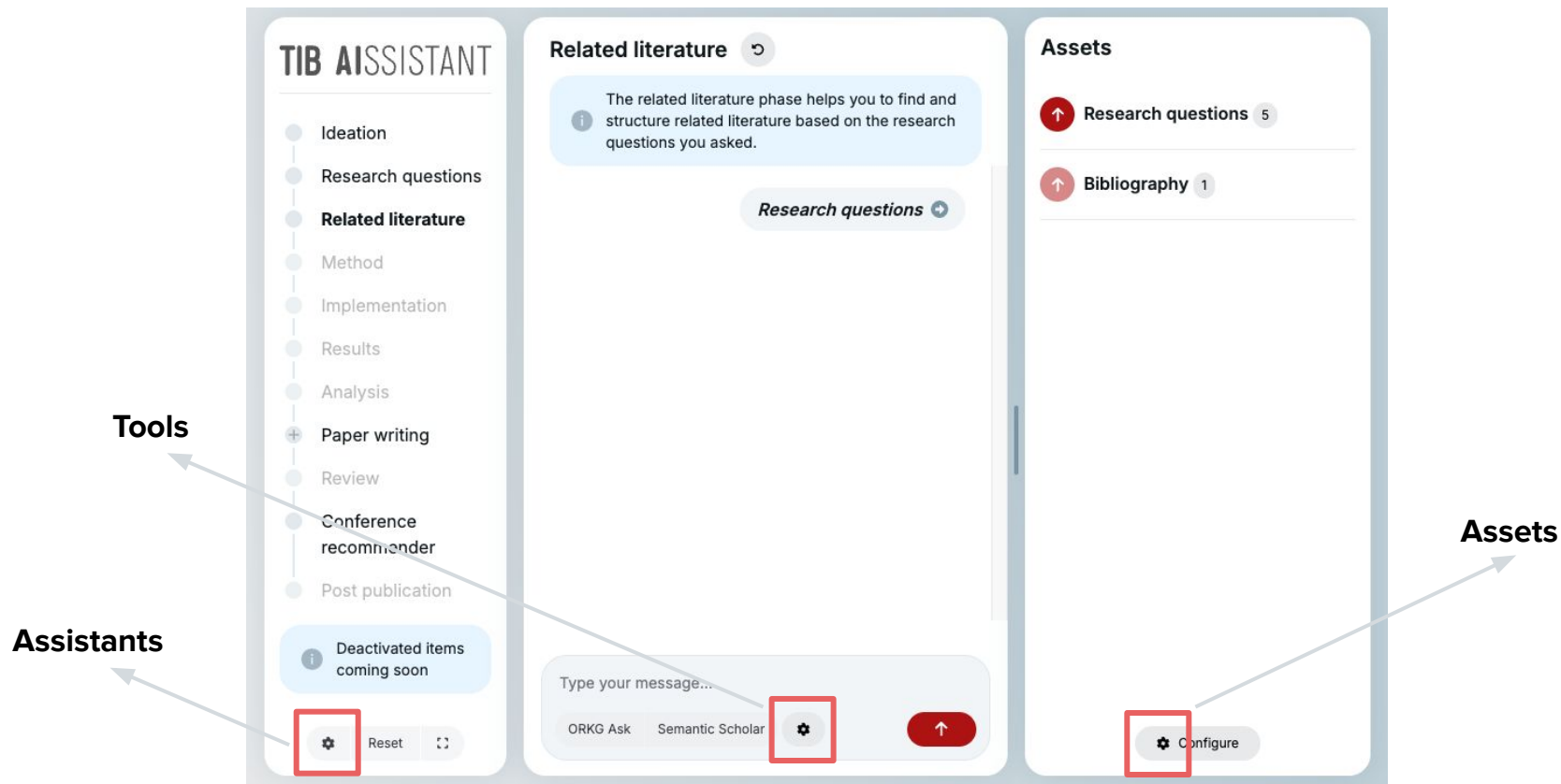
The main content area is divided into two panels. The left panel, titled 'Related literature', contains an information box explaining that this phase helps find and structure related literature based on research questions. Below this is a button labeled 'Research questions' with a plus icon. At the bottom of this panel is a text input field with the placeholder 'Type your message...', followed by buttons for 'ORKG Ask', 'Semantic Scholar', a settings icon, and a red button with an upward arrow.

The right panel, titled 'Assets', lists two items: 'Research questions' with 5 items and 'Bibliography' with 1 item. At the bottom of this panel is a 'Configure' button with a settings icon.

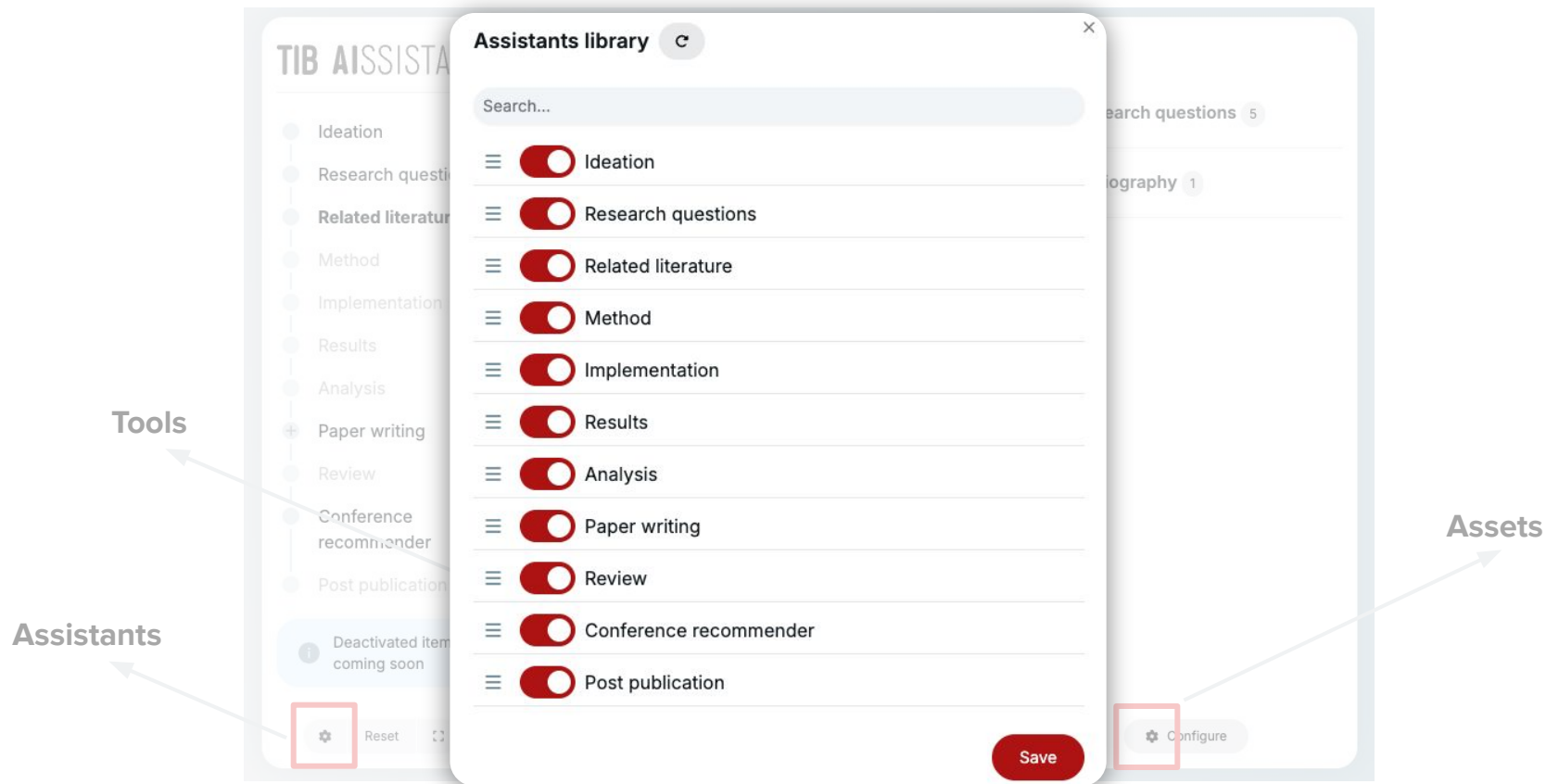
Configurability



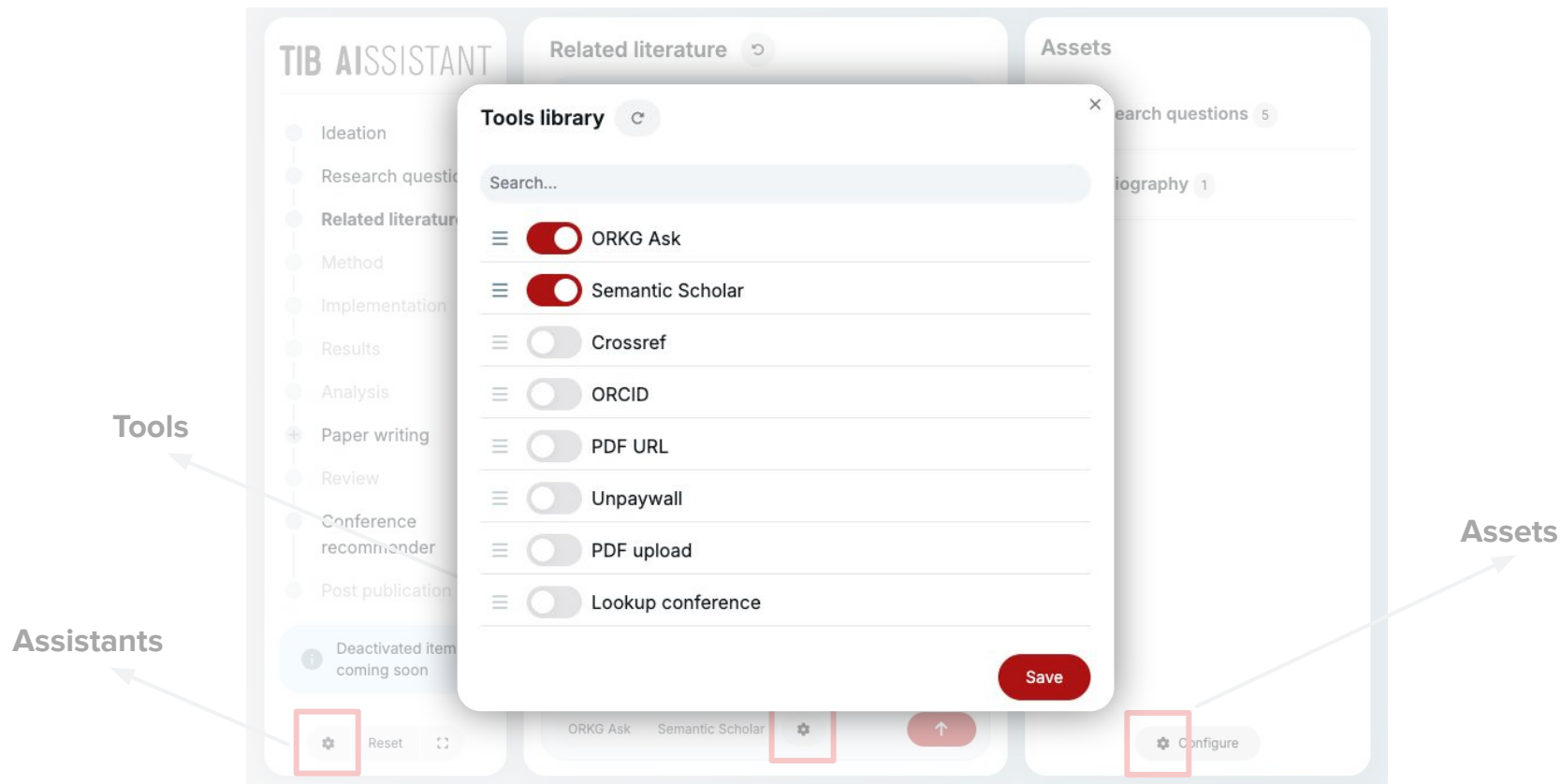
Configurability



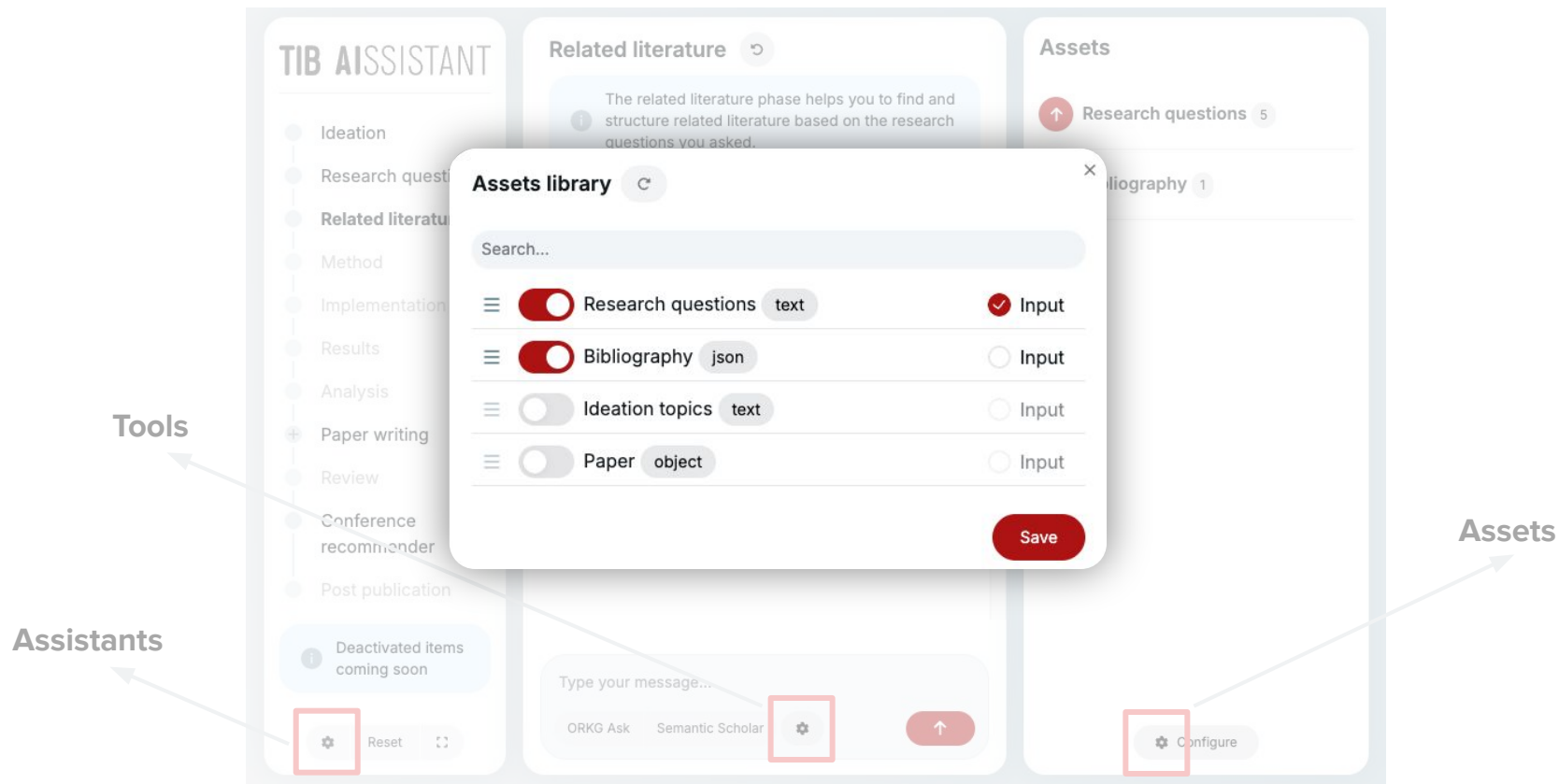
Configurability



Configurability

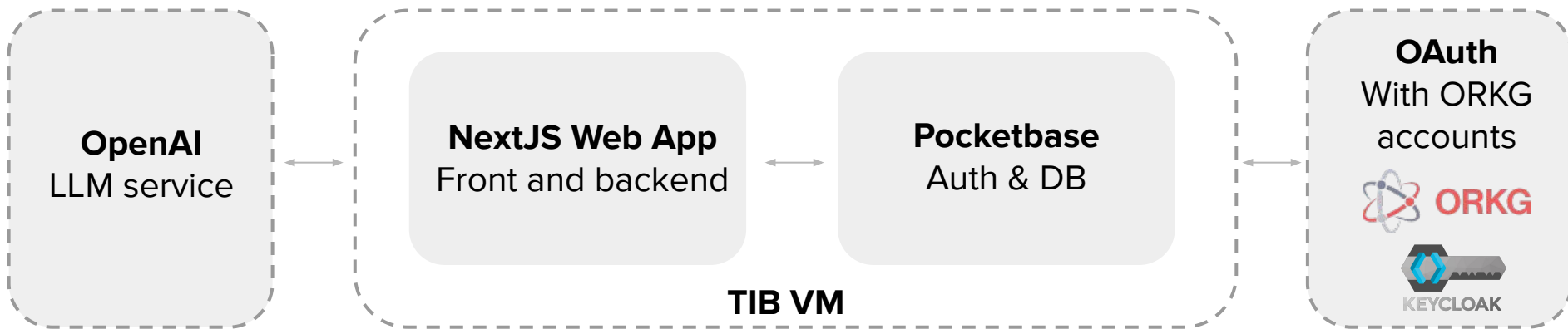


Configurability



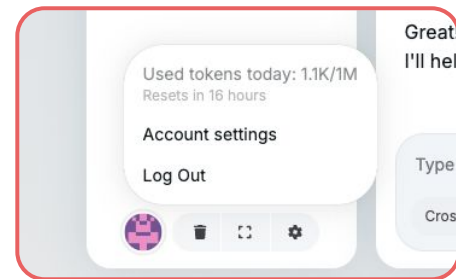
Alpha version

- Alpha version to be released soon, might contains bugs, optimize workflow soon

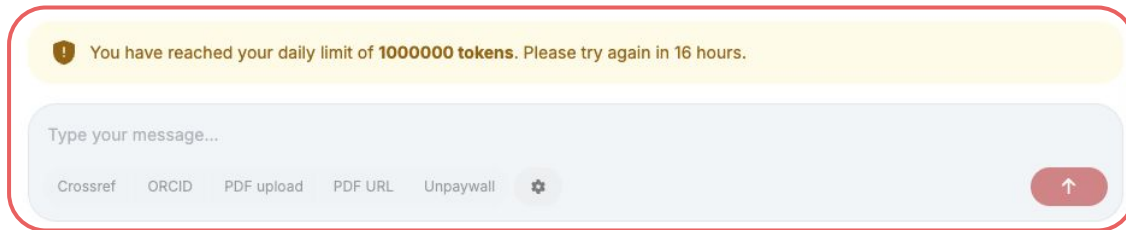


Alpha version

- Limit total tokens to 1 million per day
 - Resets automatically
- BYOK: Bring Your Own Key



Remaining tokens



Out of tokens

Publicly available code base

Repository:

<https://gitlab.com/TIBHannover/orkg/tib-aissant/web-app>

Developer documentation:

<https://tibhannover.gitlab.io/orkg/tib-aissant/web-app/storybook/?path=/docs/introduction--docs>

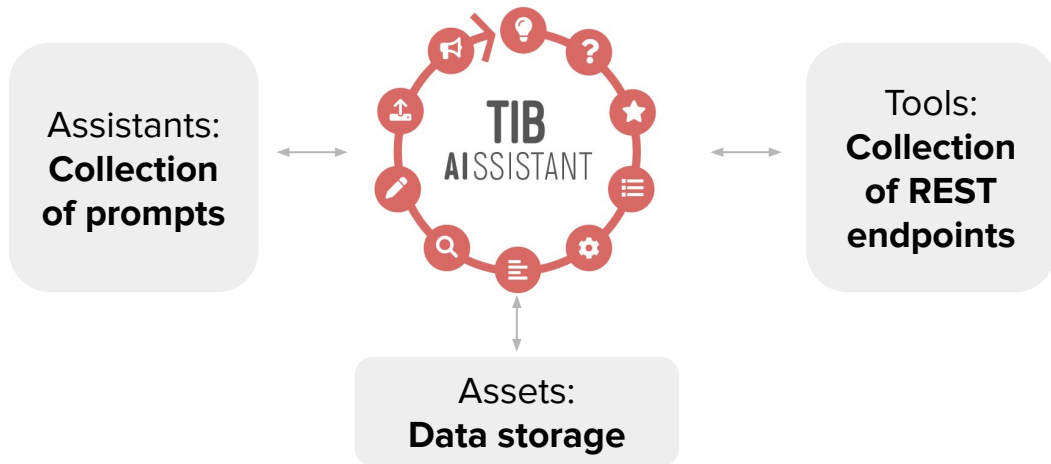
Future directions

- The Alssistant is mostly a frontend application as LLMs do the heavy lifting
- Simplifying the platform to encourage contributions



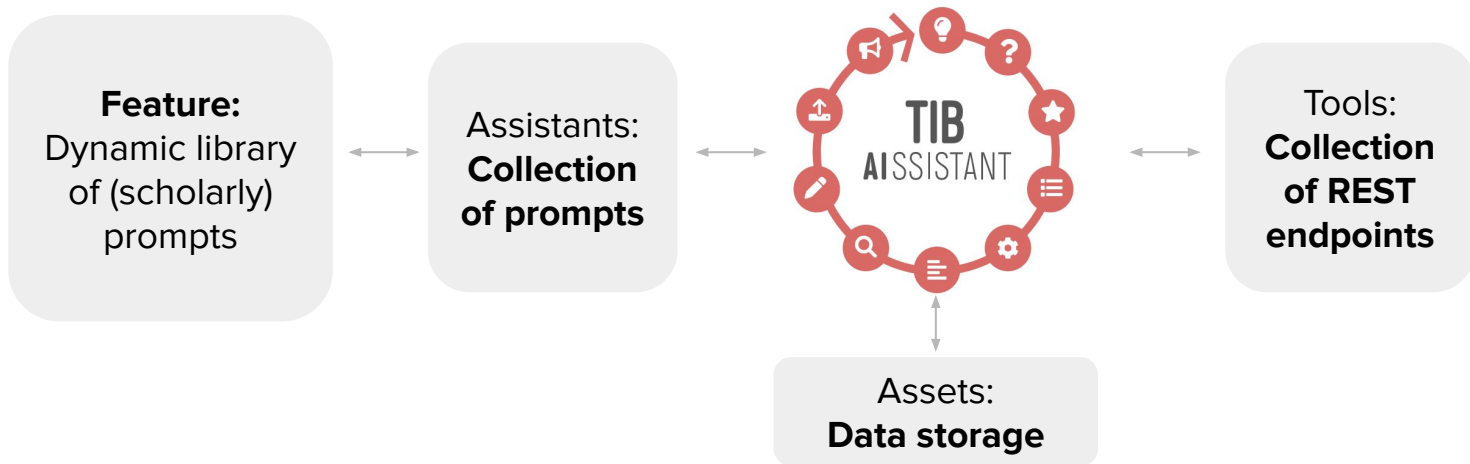
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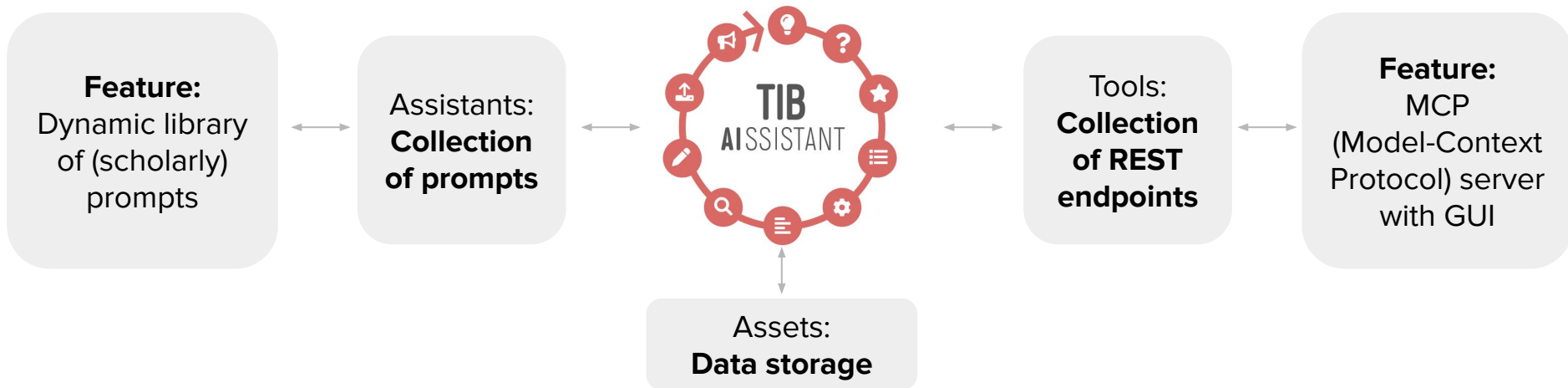
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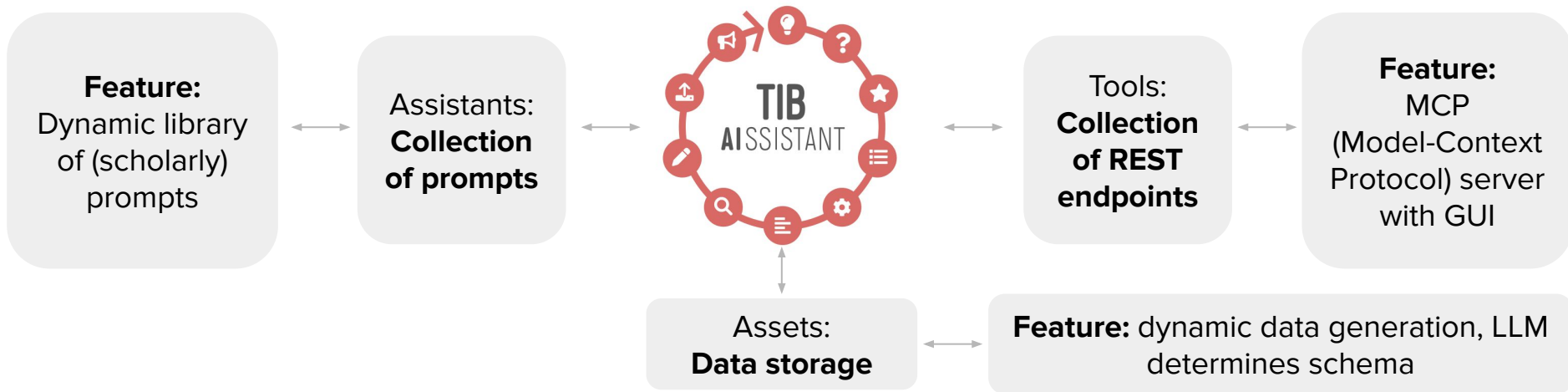
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More information soon!



STAY TUNED!

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Discussion Session

6th of November 2025 / 11:30-12:30

Interdisciplinary Colloquium on Digitalisation of Research

Machine Learning in Professional Soccer



Daniel Memmert

German Sport University
Cologne, Institute of Exercise
Training and Sport Informatics



Katja Keller

Karlsruhe Institute of
Technology, Institute of Sports
and Sports Science (IfSS)



Claudia Niessner

Karlsruhe Institute of
Technology, Institute of Sports
and Sports Science (IfSS)

DiTraRe Symposium

- **2-3 December 2025**
- ZKM Karlsruhe
- Sessions on:
 - Knowledge Representation and AI
 - Law and Ethics in Digitalisation of Research
 - Research Infrastructures
 - Impact on Science and Society
- Call for posters: **deadline 17.10!**

<https://www.ditrare.de/en/symposium-2025>



Thank you for joining!

Stay connected

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 - Email: ditrare@fiz-karlsruhe.de
 - LinkedIn: www.linkedin.com/company/ditrare
 - Mastodon: social.kit.edu/@DiTraRe
 - YouTube: www.youtube.com/@DiTraRe
 - Zenodo: zenodo.org/communities/ditrare
- Discussion forum: www.ditrare.de/en/forum
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