

iscte

INSTITUTO
UNIVERSITÁRIO
DE LISBOA

Artificial Intelligence and Current Research Information Systems

António Luís Lopes
antonio.luis@iscte-iul.pt

May, 22nd, 2026

CRIS 2026, Ponta Delgada, Açores, Portugal





ABOUT ME



Image created by ChatGPT 4.5
(António Lopes, Pixar version)



PhD in Information
Science and
Technology –
specialization in
Artificial Intelligence



Professor and
Researcher in Applied AI
(health, education,
sustainability,
bibliometrics, etc.)



Specialization Seminar
Coordinator:
Generative AI in
Teaching and
Research



Course Unit
Coordinator:
Academic Work with
Artificial Intelligence



Director of the
Information Systems
Development Services



euroCRIS Board
member for 2025/2026

AI4RIS WG co-lead

TECHNOLOGICAL EVOLUTION TO 100 MILLION USERS

AI became mainstream too fast

ChatGPT reaches 100 million users two months after launch

Unprecedented take-up may make AI chatbot the fastest-growing consumer internet app ever, analysts say



ChatGPT is owned by Microsoft-backed company OpenAI. Photograph: Pavlo Gonchar/Sopa Images/Rex/Shutterstock

ChatGPT, the popular artificial intelligence chatbot, has reached 100 million users just two months after launching, according to analysts.

[The Guardian, 2023]

Technology	Time to 100M Users
Telephone	75 years
Mobile phone	16 years
Internet	7 years
Twitter	5 years
Facebook	4.5 years
Instagram	2.5 years
TikTok	9 months
ChatGPT	2 months



SUCH POWERFUL TOOLS, YET SO LIMITED

One cannot blindly trust the results

euro
CRIS

Mother Teresa in
her “fight”
against poverty



SUCH POWERFUL TOOLS, YET SO LIMITED

One cannot blindly trust the results

I want to wash my car and the car wash is only 100 meters away. Do you think I should drive there or walk?

Quick decision: walk.

Why?

- 100 m $\approx$ 1–2 minutes on foot
- Cold-starting the engine for 100 m $\rightarrow$ unnecessary wear
- Higher fuel consumption + emissions during cold start
- Hardly any time saved compared to walking
- A bit of movement doesn't hurt

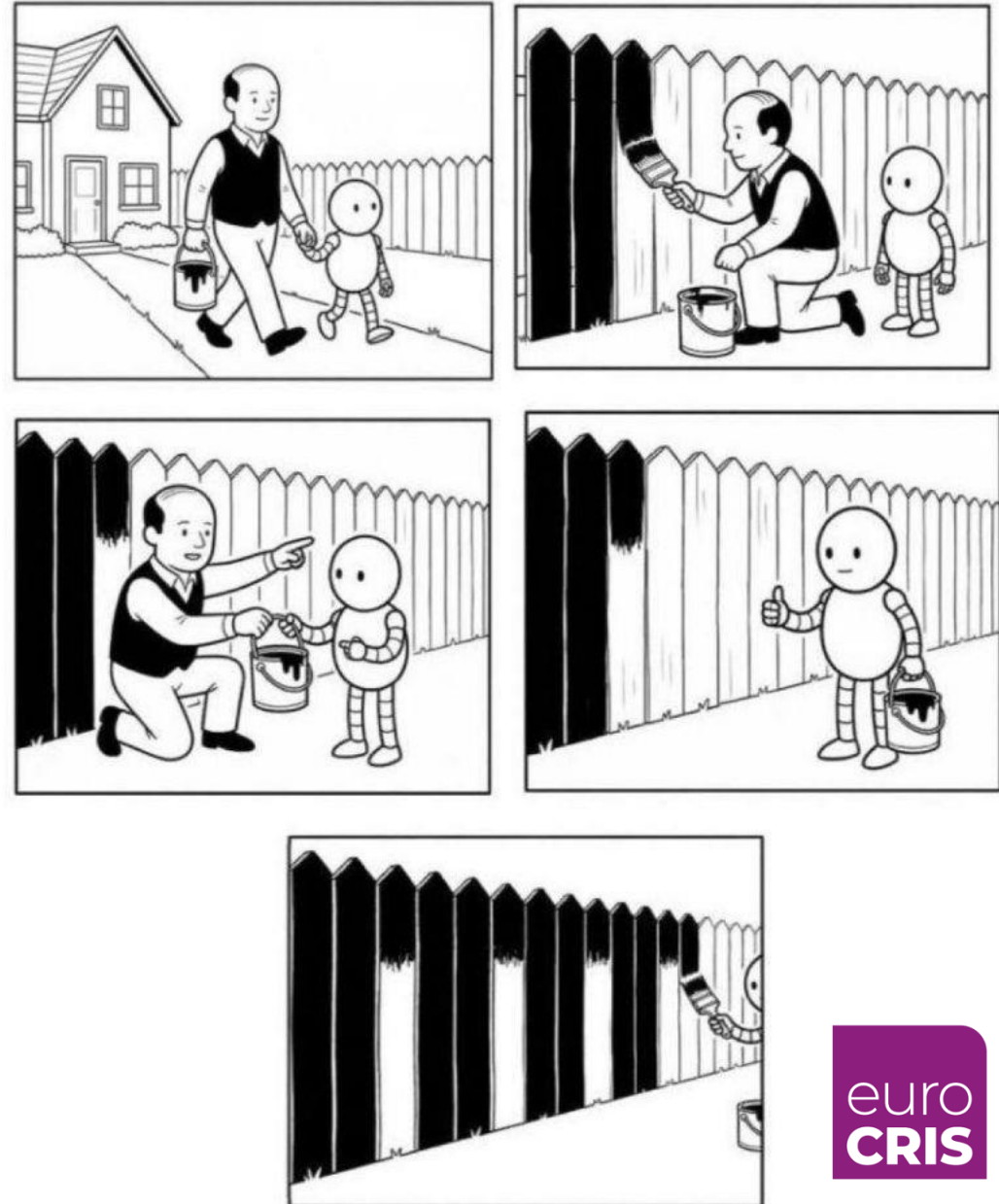
AI doesn't really
understand the
world!



WONDERFUL CAPTURERS OF PATTERNS

Not real knowledge acquirers

- AI is great at capturing the patterns of human cognition.
- But it doesn't understand what it is doing when playing back those same patterns.
- **AI is just a really advanced parrot!**



DOES THIS MEAN ARTIFICIAL INTELLIGENCE IS NOT USEFUL?

Subjective Tasks

Excels at generating content that exists on a spectrum of quality.

Ideal for subjective outputs where there is no single right answer.



Judged by the nuance and quality of the response.

Evaluated on a spectrum between good and bad.



Primary Utility

Evaluation Metric

Factual Tasks



Requires strict grounding in truth statements or verified data.

Unreliable for factual or contextual outputs without external validation.



Measured by binary accuracy against reality.

Requires verification of being strictly right or wrong.

*“But António, what does any of this
have to do with Current Research
Information Systems?”*



AI AND CURRENT RESEARCH INFORMATION SYSTEMS

Enormous potential and risk at the same time

→ POTENTIAL

- Institutions manage research information for visibility, compliance, Open Science, research assessment, collaboration discovery, funding intelligence, and institutional strategy. CRIS are the institutional memory of research.
- AI can make that memory more usable, connected, and actionable.

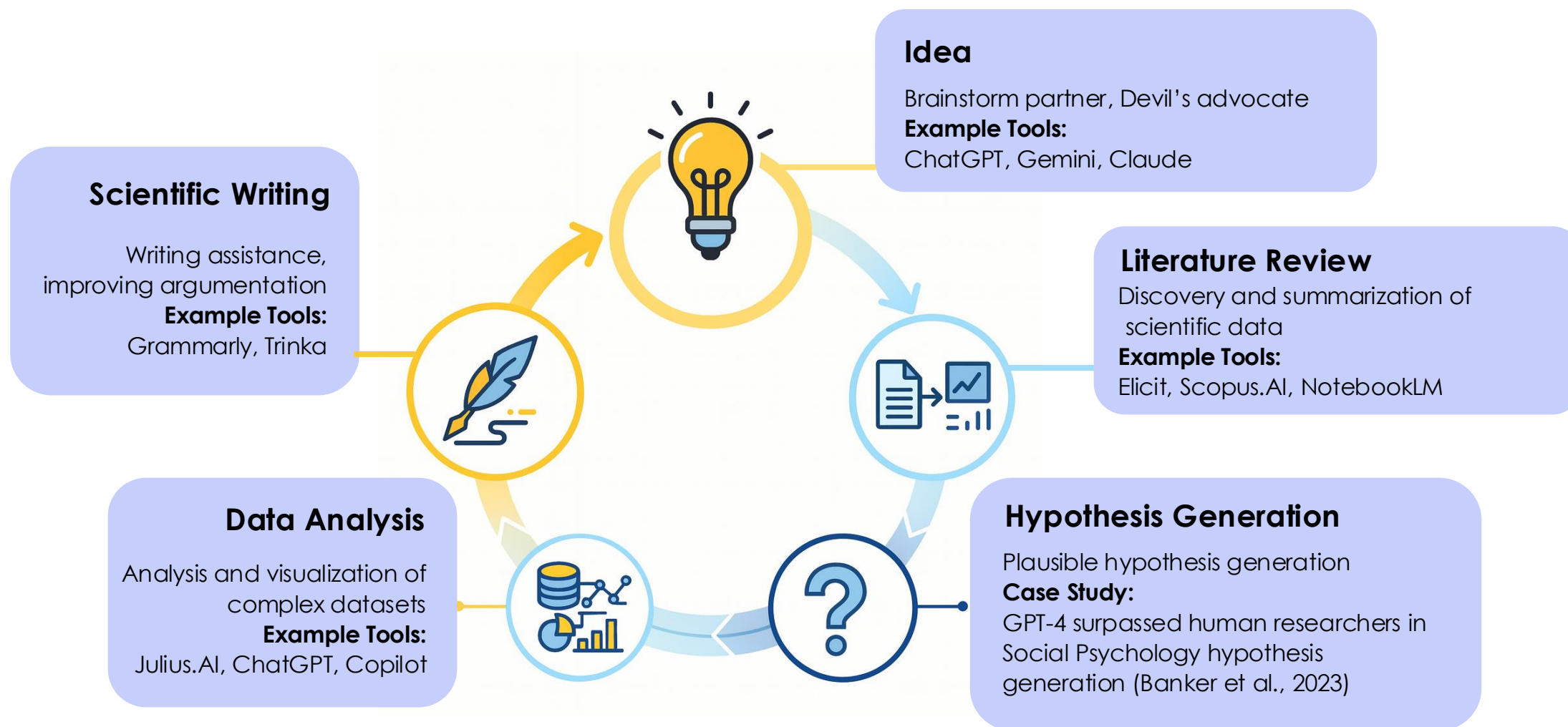
→ RISK

- But AI can also distort it, extract from it, or automate decisions on top of weak or decontextualized data.
- AI enters CRIS at exactly the point where research information becomes both more valuable and more vulnerable.

When we discuss AI in CRIS, we are discussing AI inside the knowledge infrastructure through which institutions understand, represent, evaluate, and expose their research.

FIRST WAVE: AI FOR PERSONAL PRODUCTIVITY

AI as partner in the scientific method



SECOND WAVE: AI EMPOWERING SCIENCE INFRASTRUCTURE

How AI can help CRIS

→ AI-assisted annotation

- AI can analyse publications and suggest relevant metadata, increasing the efficiency and accuracy of publication annotation.
- AI can also be used for literature analysis, schema inference, and automatic dataset detection.

Example: IMBI Freiburg

→ Knowledge Graph Enrichment

- AI can enrich and interconnect research records, extract entities, resolve ambiguities, and discover latent relationships.
- AI can also be used to extract and validate ORCIDs, classify scientific fields, and map citation, co-authorship, and funding networks.

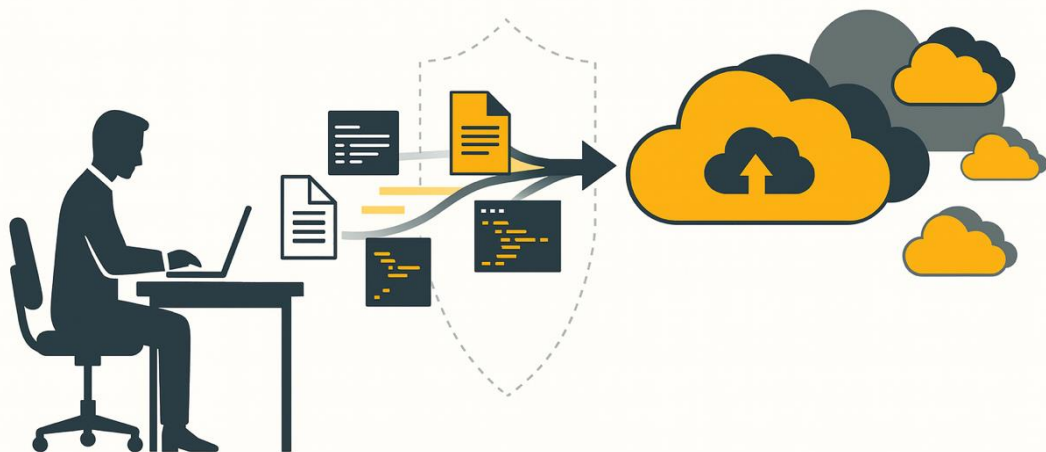
Example: OpenAIRE Graph

→ Structured Data Exploration

- AI assistants and chatbots can translate natural language into complex queries, allowing interaction with data without technical knowledge.
- For example, use a chatbot to query a specific domain knowledge base, basing LLM responses on structured data.

Example: GRAPHIA project

The integration of AI into scientific workflows introduces a new and complex set of security, legal, and ethical challenges that threaten the very foundations of open science.



Potential Privacy Problem

When using these tools, any data that is shared resides in the infrastructure of the companies that create them.

This data can be used to train future AI models.

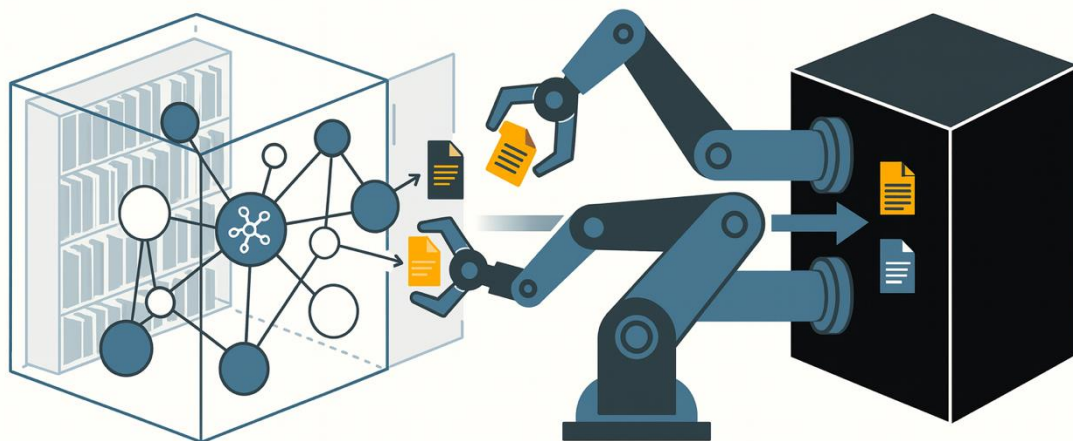
If this data is sensitive or private, it can constitute a potential privacy issue.

Data repositories and scientific outputs were designed for human access, knowledge dissemination, and academic reuse, but they end up falling victim to bots that extract enormous amounts of data without any consent.

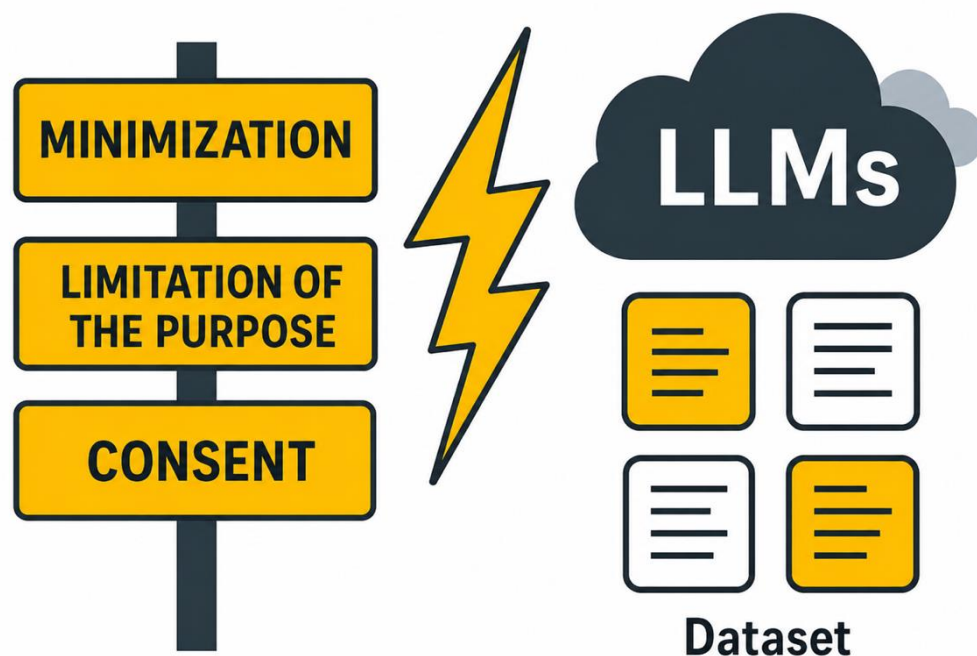
Non-reciprocal reuse

AI companies use this data to train models. Not only does this create an overload on the scientific infrastructure, but the knowledge is reused without credit, context, or benefit to the communities that created it.

The value generated only benefits proprietary and closed systems.



The fundamental principles of data protection, such as minimization, purpose limitation, and consent, often clash with the workings of language models, which can retain user data indefinitely.



Unlikely (or impossible) compliance

How can an organization comply with a “right to be forgotten” request if an individual’s data has already been absorbed by a language model?

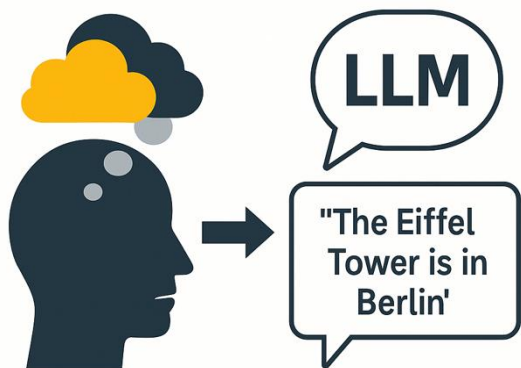
The lack of transparency about how and where data is stored by AI vendors makes demonstrating compliance nearly impossible.

ETHICAL AND EPISTEMIC RISKS

The promise of AI and its challenges

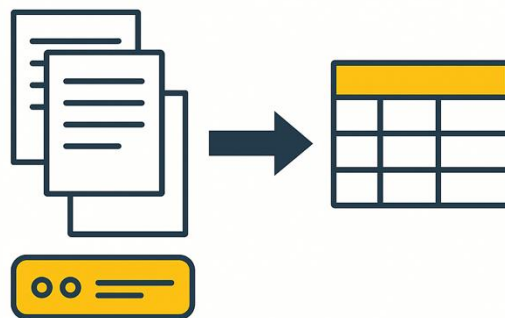
→ Hallucination and Factuality

- Language models generate coherent texts but not based on factual accuracy.
- There is a risk of spreading false information with an appearance of authority, which can undermine trust in science.



→ Loss of context and meaning

- The need to make data more machine-readable can lead to oversimplification, removing contextual metadata.
- We risk losing context and meaning in the "translation" of qualitative data into standardized formats.



→ Erosion of Scientific Integrity

- The responsibility of each individual (or the lack thereof) in the use of AI tools is a determining factor in the quality of scientific work.
- The pressure to publish leads researchers to see AI as a productivity multiplier, focusing on quantity rather than quality.





The three-dimensional porous mesh structure of Cu-based metal-organic-framework - aramid cellulose separator enhances the electrochemical performance of lithium metal anode batteries

Manshu Zhang^{a,1}, Liming Wu^{a,1}, Tao Yang^b, Bing Zhu^a, Yangai Liu^{a,*}

^a Beijing Key Laboratory of Materials Utilization of Nonmetallic Minerals and Solid Wastes, National Laboratory of Mineral Materials, School of Material Technology, China University of Geosciences, Beijing 100083, China

^b College of Materials & Environmental Engineering, Hangzhou Dianzi University, Hangzhou 310036, China

ARTICLE INFO

Keywords:

Lithium metal battery
Lithium dendrites
CuMOF-ANFs separator

ABSTRACT

Lithium metal, due to its advantages of high theoretical capacity, low density potential, is used as a negative electrode material for batteries and brings great energy storage systems. However, the production of lithium metal dendrites is poor safety, so lithium dendrites have been the biggest problem of lithium metal batteries. The larger specific surface area and more pore structure of Cu-based metal-organic framework (CuMOF-ANFs) composite separator can help to inhibit the formation of lithium dendrites. The discharge capacity retention rate of the Li-Cu battery using the CuMOF-ANFs composite separator is 95.2%, the discharge capacity retention rate of the Li-Cu battery using the CuMOF-ANFs composite separator is 95.2%. Li-Li batteries can continue to maintain low hysteresis for 2000 h at the 100% depth of discharge. The results show that CuMOF-ANFs composite membrane can inhibit the generation of lithium dendrites, improve the cycle stability and cycle life of the battery. The three-dimensional (3D) porous separator provides a new perspective for the practical application of lithium metal batteries.

1. Introduction

Certainly, here is a possible introduction for your topic: Lithium-metal batteries are promising candidates for high-energy-density rechargeable batteries due to their low electrode potentials and high theoretical capacities [1,2]. However, during the cycle, dendrites forming on the lithium metal anode can cause a short circuit, which can

chemical stability of the separator is equal to the separator remains intact and does not cause the leakage of the electrolyte or other battery components. The CuMOF-ANFs composite separator helps to prevent the formation of lithium dendrites and further promote dendrite growth. Research on different materials and designs for separators with high mechanical strength and chemical stability is necessary to improve the performance of lithium metal batteries.



The responsibility lies with the researcher for the good (or bad) use of this type of tool.

Irresponsible use of GenAI may propagate into CRIS.

“But António, if there are all these problems, how can we safely use AI in our CRIS?”





Governance

Who decides,
validates, audits,
and is
accountable?



Principles

What data
standards, rights, and
values guide the
system?



Tools

What technical
architecture
mitigates the risks?



PILLAR 1 - GOVERNANCE

Responsible AI in
CRIS starts with
institutional rules



Which CRIS data
can AI access?



Which fields can
AI suggest but
not change?



Who validates
AI-generated
metadata?



How are AI actions
logged?



How can
researchers contest
AI-generated
records?



Who is
accountable for
errors?

For AI to be trustworthy, the underlying data must be of high quality. The FAIR (Findable, Accessible, Interoperable, Reusable) principles are the starting point, but the AI era demands a new layer of accountability.

FAIR → FAIR-R

“Responsibly-licensed”

FAIR → FAIR²

“AIR – AI-Readiness”

“RAI – Responsible-AI”

Operationalizing FAIR for the AI era

It is not enough for the data to be reusable; its license must be clear, machine-readable, and suitable for training AI models.

But we must also explore new, more sophisticated sharing models that balance openness with protection:



Conditional
Openness



Reciprocal
Openness



Protected
Openness

Governance and principles need to be implemented through technological architectures that mitigate the risks inherent in AI models. The solution is not just to create better models, but to better control their inputs and outputs.

RAG Architecture: Grounding Answers in Verifiable Sources



1. Query

User asks the question



2. Retrieval

Search a vector database of internal and verified documents to find the most relevant ones.



3. Augmentation

The obtained documents are inserted into the prompt and alongside the original question, serving as context.



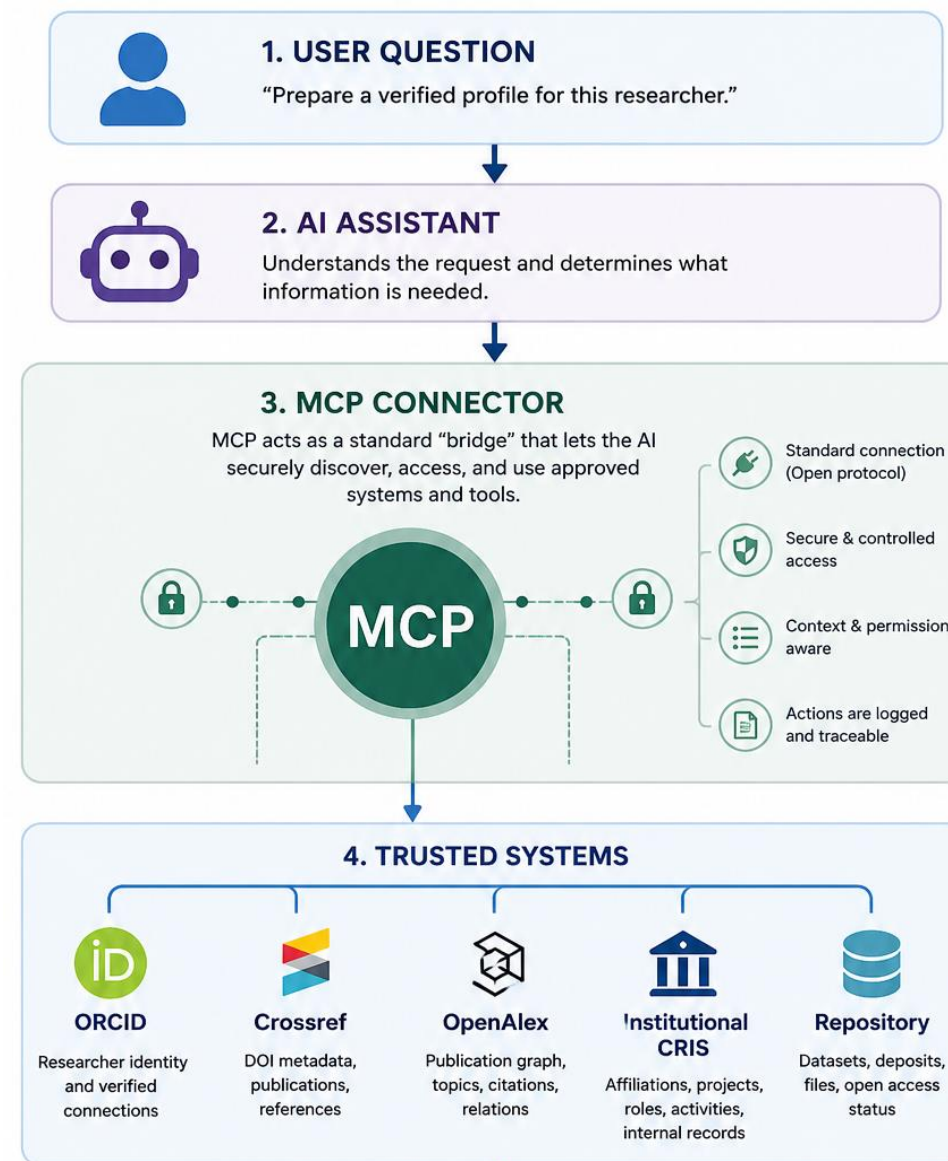
4. Generation

"Answer this question using ONLY the sources provided."

MCP: MODEL CONTEXT PROTOCOL

Define how AI can talk to trusted systems

- MCP, Model Context Protocol, is like a common connector that allows an AI assistant to access approved data sources and tools, instead of relying only on what the AI model “remembers”
- MCP does not make AI trustworthy by itself. It makes it possible to connect AI to trustworthy systems, under institutional control.





Ricardo Hartley Belmar ✓ • 1st

I study what's overlooked and trace what's forgotten. Some of it ...

3mo • 🌐

Just published "MCP CRIS Live" on Docker Hub, looking for feedback and collaborators

An open-source MCP server that gives AI agents real-time access to scientific research data:



“Prepare a small summary on the profile of the researcher given by the ORCID profile with ID 0000-0003-3045-0304, highlighting in particular the publication with DOI 10.1177/01655515251330579”

* António returns!

Prepare a small summary on the profile of the researcher given by the ORCID profile with ID 0000-0003-3045-0304, highlighting in particular the publication with DOI 10.1177/01655515251330579.



Opus 4.7 ▾



“But António, why should we open our CRIS to these companies and their chatbots?”



Not because companies need our data.
Because society needs our science.

People are already asking AI systems to explain the world.

Our shared responsibility, as CRIS managers and researchers, is to make sure the answer points back to trusted research, with context, attribution and provenance.

Go where the people are. Bring the evidence along.



OBRIGADO
(that's "Thank you" in
Portuguese)



euroCRIS Working Group

Artificial intelligence for Research Information Systems

António Luís Lopes (Portugal)

Email: antonio.luis@iscte-iul.pt ,
antonio.luis@eurocris.org

Aurelia Andrés (Spain)

Email: aurelia.andres@fecyt.es,
aurelia.andres@eurocris.org

AI4RIS

Join us to help decide the future of AI
and Research Information Systems



Explore AI applications that
enhance data management and
streamline workflows in RIS



Identify key use cases for AI
integration in RIS and address
challenges institutions face when
implementing AI technologies.



Foster discussion around best
practices and ethical
considerations.



iscte

INSTITUTO
UNIVERSITÁRIO
DE LISBOA

in

f



www.iscte-iul.pt

António Luís Lopes
antonio.luis@iscte-iul.pt

eiC
iC
e

iscte

IST

iscte

INSTITUTO
UNIVERSITÁRIO
DE LISBOA