

Introduction to AI in Research

Integrating AI into the Research Process

Integrating artificial intelligence (AI) into the research process can help streamline tasks ranging from initial ideation and literature mapping to the organization of complex outlines.

While AI tools can serve as powerful aids for brainstorming, refining research questions, and summarizing dense scholarly texts, they can also produce misleading information, biased outputs, or fabricated citations, and so they should be treated as a starting point rather than a final authority.

Ultimately, the researcher is always responsible for their work, and they must evaluate AI outputs, and ensure complete transparency in how any AI tools were used in the research process.

AI Research Ecosystem

Now that AI tools are everywhere online, the challenge in research is no longer a lack of information, but rather the ability to discern which tools are best suited for specific tasks. Understanding the range of AI tools is helpful for maintaining research integrity, ensuring data accuracy, and effectively streamlining the transition from raw data to a final product.

By understanding what different AI tools do best and where they get their data, researchers can better avoid risks like "hallucinations," and to take advantage of the unique strengths of each tool.

In this tutorial we'll consider three types of AI tools.

1. Large Language Models (LLMs)

LLMs are trained on massive datasets encompassing a significant portion of the public internet, including websites, forums (e.g., Reddit), public domain books, and licensed media. These tools excel at creative brainstorming, recognizing patterns, and writing fluent and natural text

Some examples of LLMs include:

- [ChatGPT](#) (OpenAI)
- [Claude](#) (Anthropic)
- [Copilot](#) (Microsoft)
- [Gemini](#) (Google)
- [Grok](#) (xAI)

While highly capable at drafting and summarizing, LLMs can produce factual errors because they rely on static, pre-trained data rather than live search engines. They are best utilized for ideation, outlining, and stylistic editing.

2. Academic AI

Unlike general LLMs, Academic AI tools search a restricted set of content drawn from scholarly databases. They pull data from publisher partnerships, preprint servers (like arXiv), PubMed, and the Semantic Scholar index.

Even better, Academic AI tools use a system called Retrieval-Augmented Generation (RAG) to make sure their answers are always up-to-date and backed by real, verifiable citations from peer-reviewed research.

Some examples of Academic AI tools include:

- [Consensus](#)
 - Helps you see what the data says across thousands of papers.
- [Elicit](#)
 - Automates parts of the literature review process.
- [Scite.ai](#)
 - Tells you if other researchers agreed or disagreed with a paper.

Note that while most Academic AI tools have free versions, you'll need a paid subscription to unlock all their features.

3. Source Grounded AI Tools

Sometimes referred to as a Small Language Model (SLM), these tools work within a "closed-loop" system, meaning they only know what the researcher tells them. Instead of scanning the whole internet or massive research databases, these tools look only at the specific documents, notes, or PDFs that are uploaded into the tool. Because the AI is locked into these files, it won't pull in outside misinformation or hallucinate random facts.

Some examples of LLMs include:

- [Adobe Acrobat AI Assistant](#)
 - Helpful for navigating long PDF documents.
- [Gemini Notebook](#) (Google)
 - Creates a personalized AI grounded in your uploaded sources.
- [Obsidian](#) (with Smart Connections):
 - Helpful in finding hidden links within your Markdown files.

Copyright and Source Grounded AI Tools

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