
CAPSTONE PROJECT

RESEARCH AGENT

Presented By:

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OUTLINE

- Problem Statement
- Technology used
- Wow factor
- End users
- Result
- Conclusion
- Git-hub Link
- Future scope
- IBM Certifications

PROBLEM STATEMENT

Researchers, students, and professionals often struggle to stay updated with the rapidly growing volume of academic publications, technical articles, datasets, and evolving research trends. Manually reviewing, filtering, and synthesizing information across multiple domains is time-consuming and inefficient.

Proposed Solution:

An AI Research Agent that uses Natural Language Processing (NLP), Retrieval-Augmented Generation (RAG), to assist users in conducting efficient literature reviews, generating summaries, identifying research gaps, and recommending relevant papers, datasets, or collaborators.

TECHNOLOGY USED

IBM cloud lite services

Natural Language Processing (NLP)

Retrieval Augmented Generation (RAG)

IBM Granite model

IBM CLOUD SERVICES USED

- IBM Cloud Watsonx AI Studio
- IBM Cloud Watsonx AI runtime
- IBM Cloud Agent Lab
- IBM Granite foundation model

WOW FACTORS

This agent will significantly reduce research time, improve the quality of literature reviews, help early-stage researchers find direction, and foster interdisciplinary collaboration by making knowledge more accessible and actionable.

Unique features:

Semantic search across research papers, journals, and datasets

Auto-summarization of selected papers

Citation and reference analysis to trace influence

Recommendation of research papers based on a user's current topic

Trend analysis over time for specific keywords or domains.

Collaboration mapping: suggests potential co-authors or institutions based on similar research interests.

END USERS

- Academic Researchers
- Research Institutions and Universities
- Industry R&D Teams
- Educators

RESULTS

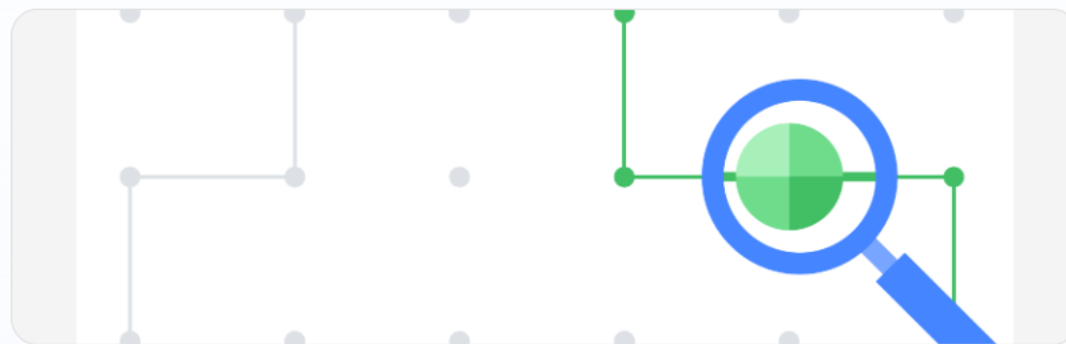
Agent preview



Research Agent 02:54 PM

Welcome to Research Agent

The agent can generate reports, suggest hypotheses, and even draft sections of research papers.



Type something...



RESULTS

Agent preview



You: 02:55 PM

Show me recent research on artificial intelligence.



Research Agent 02:55 PM

Here are some recent research articles and news on artificial intelligence:

1. **MIT News:** In a new study, researchers discover the root cause of a type of bias in LLMs, paving the way for more accurate and reliable AI systems. [Read more](#)
2. **arXiv:** Harnessing AI Agents to Advance Research on Refugee Child Mental Health. [Read more](#)
3. **Stanford HAI:** News on how artificial intelligence improves patient care and expands research capacity. [Read more](#)
4. **Journal of Artificial Intelligence Research:** Current Issue on machine learning, natural language, planning and scheduling, robotics and vision, and uncertainty in AI. [Read more](#)
5. **ScienceDaily:** A team of researchers has shown that even small-scale quantum computers can enhance machine learning performance. [Read more](#)
6. **McKinsey:** The latest McKinsey Global Survey on AI finds that organizations are beginning to take steps that drive bottom-line impact. [Read more](#)
7. **Apple Machine Learning Research:** Overview of the latest advancements in machine learning and artificial intelligence. [Read more](#)

Type something...



RESULTS

Agent preview



You: 02:56 PM

Help me write an introduction for a paper on electric vehicles.



Research Agent 02:56 PM

Here are some recent research articles and news on artificial intelligence:

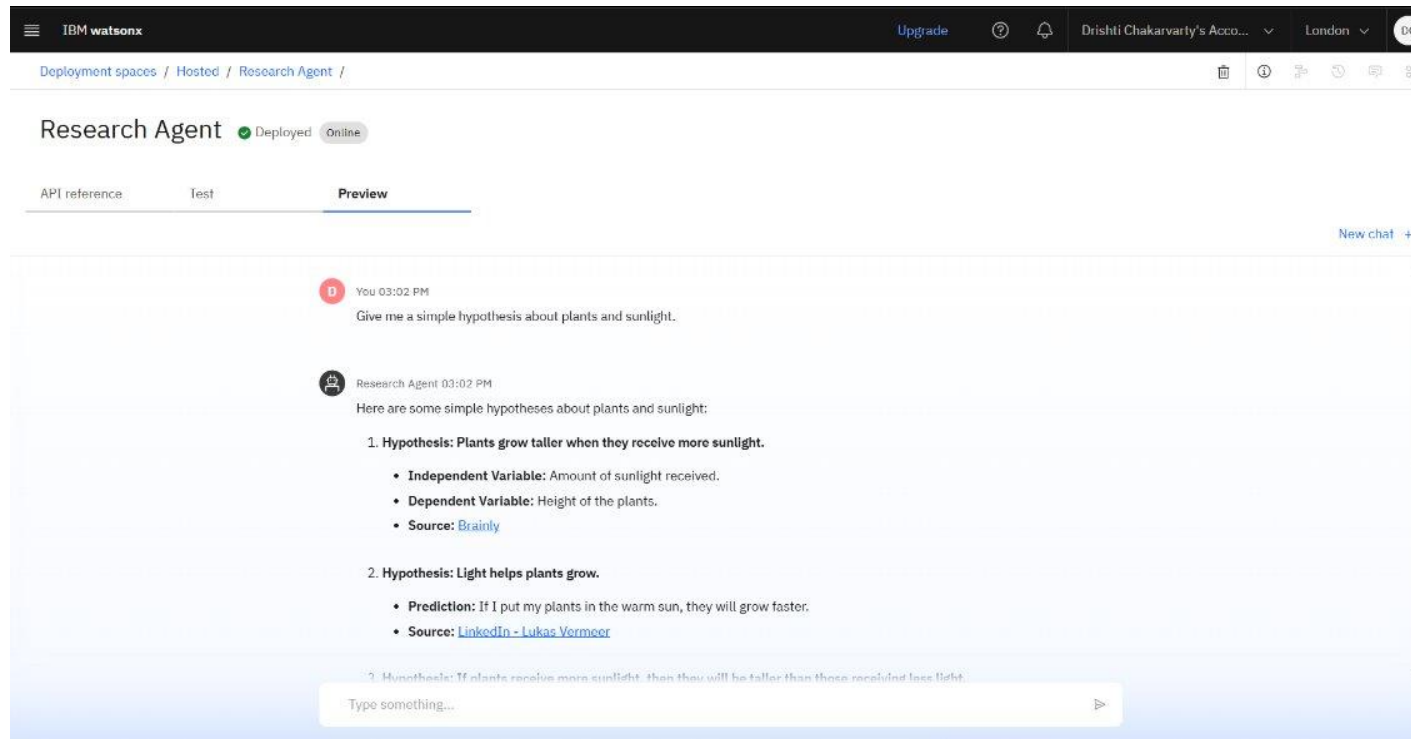
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Type something...



RESULTS

Deployed AI Agent



The screenshot displays the IBM watsonx user interface. At the top, a dark navigation bar includes the 'IBM watsonx' logo, an 'Upgrade' button, and user account information for 'Drishti Chakarvarty's Acco...'. Below this, a breadcrumb trail shows 'Deployment spaces / Hosted / Research Agent'. The main content area features a tabbed interface with 'API reference', 'Test', and 'Preview' tabs. The 'Preview' tab is active, showing a chat conversation. The chat history includes a user query and a detailed response from the 'Research Agent' providing hypotheses about plants and sunlight, with specific variables and sources cited. A text input field at the bottom is labeled 'Type something...'. A 'New chat +' button is located in the top right corner of the chat area.

IBM watsonx Upgrade ? ⓘ Drishti Chakarvarty's Acco... London DC

Deployment spaces / Hosted / Research Agent

Research Agent Deployed Online

API reference Test **Preview**

New chat +

You 03:02 PM
Give me a simple hypothesis about plants and sunlight.

Research Agent 03:02 PM
Here are some simple hypotheses about plants and sunlight:

- Hypothesis: Plants grow taller when they receive more sunlight.**
 - **Independent Variable:** Amount of sunlight received.
 - **Dependent Variable:** Height of the plants.
 - **Source:** [Brainly](#)
- Hypothesis: Light helps plants grow.**
 - **Prediction:** If I put my plants in the warm sun, they will grow faster.
 - **Source:** [LinkedIn - Lukas Vermeer](#)
- Hypothesis:** If plants receive more sunlight, then they will be taller than those receiving less light.

Type something...

CONCLUSION

- The agent can generate reports, suggest hypotheses, and even draft sections of research papers.
- It saves time by automating repetitive tasks like citation management and data extraction.
- Research Agents enhance efficiency, accuracy, and innovation in both academic and industrial R&D.

FUTURE SCOPE

- Multilingual Research Support
- Voice-Activated Research Assistant
- Real-Time Collaboration Features
- Research Gap and Novel Topic Identification
- Integration with Publishing Platforms
- AI-Assisted Paper Drafting

IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



Malkeet Singh

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 16, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/f354c79b-9221-48b7-9f96-fb2733da81c8>





This certificate is presented to

Malkeet Singh

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record



Git hub link : <https://github.com/Malkeet-Singh-1804/-Research-Agent->



THANK YOU