

CAPSTONE PROJECT

TRAVEL AGENT

Presented By:

Student name : Astha Dilip Tayade

College Name & Department : MIT academy of Engineering,Alandi

Department:ENTC

OUTLINE

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

PROBLEM STATEMENT

The Challenge- A Research Agent is an AI system designed to assist with academic and scientific research tasks. It can autonomously search for literature, summarize papers, and organize references. Using natural language processing, it understands research questions and retrieves relevant information. 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. Technology - Use of IBM cloud lite services /IBM Granite is mandatory.

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

IBM watsonx

Upgrade ?

Astha Tayade's Account

Dallas

AT

Projects / Astha's sandbox / Research Agent

Share feedback 3 Autosave on New agent + Deploy

Build

AI Model: granite-3-3-8b-instruct

Setup

Name

Research Agent

Description 97/100

AI research assistant that summarizes papers, finds references, and helps draft reports using IBM

Icon

Placeholder image

Quick start questions

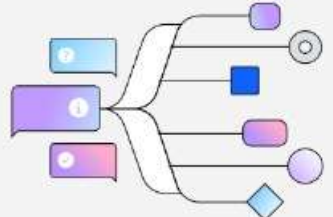
Add up to 4 quick start questions that your users can select.

Agent preview

Research Agent 06:56 PM

Welcome to Research Agent

AI research assistant that summarizes papers, finds references, and helps draft reports using IBM



Type something...

RESULTS

Projects / Astha's sandbox / Agent Lab

Share feedback β Unsaved New agent + Deploy

Build

AI Model: llama-3-3-70b-instruct

Setup




Name

Research Agent

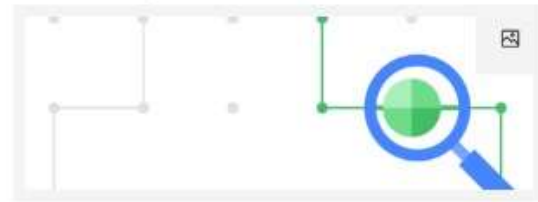
Description 97/100

AI research assistant that summarizes papers, finds references, and helps draft reports using IBM

Icon



Placeholder image



Quick start questions

Add up to 4 quick start questions that your users can select. +

Agent preview

AT You: 07:03 PM

Summarize recent research on quantum computing.


Research Agent 07:03 PM


Quantum Computing Research Summary:

- Quantum Algorithms:* Recent studies have focused on developing quantum algorithms for solving complex problems, such as Shor's algorithm for factorization and Grover's algorithm for search.
- Quantum Error Correction:* Researchers have made significant progress in developing quantum error correction techniques, including surface codes and topological codes, to mitigate errors in quantum computations.
- Quantum Machine Learning:* The intersection of quantum computing and machine learning has gained attention, with research on quantum neural networks, quantum support vector machines, and quantum k-means clustering.

Key Advances:

- Quantum Supremacy:* Google's demonstration of quantum supremacy in 2019 marked a significant milestone, showing that quantum computers can perform certain tasks beyond the capabilities of classical computers.
- Quantum Simulation:* Quantum computers have been used to simulate complex quantum systems, enabling new insights into quantum chemistry and materials science.

Type something... 



RESULTS

IBM watsonx

Upgrade ? Bell Astha Tayade's Account Dallas AT

Projects / Astha's sandbox / Agent Lab

Share feedback B Unsaved New agent + Deploy

Build

AI Model: llama-3-3-70b-instruct

Setup

Name

Research Agent

Description 97/100

AI research assistant that summarizes papers, finds references, and helps draft reports using IBM

Icon

Placeholder image

Quick start questions

Add up to 4 quick start questions that your users can select.

Agent preview

AI You: 07:03 PM

What are the top papers on generative AI in healthcare?

Research Agent 07:03 PM

Generative AI in Healthcare: Key Papers

- Medical Image Synthesis:** Papers like "Medical Image Synthesis for Data Augmentation and Privacy Protection" explore the use of generative models for synthesizing medical images, enhancing dataset diversity and privacy.
- Disease Diagnosis:** Studies such as "Generative Adversarial Networks for Disease Diagnosis" demonstrate the potential of generative AI in diagnosing diseases from medical images and patient data.
- Personalized Medicine:** Research like "Personalized Medicine with Generative Models" discusses how generative AI can be used to tailor treatment plans to individual patients based on their unique characteristics and medical histories.

Suggested Research Directions:

- Investigate the application of generative AI in *predicting patient outcomes and identifying high-risk patients*.
- Explore the use of generative models for *synthesizing electronic health records and protecting patient privacy*.

Type something...

RESULTS

Deployed AI Agent

The screenshot displays the IBM watsonx user interface. At the top, the navigation bar includes the IBM watsonx logo, an 'Upgrade' button, and user account information for 'Asthayade's Account' in 'Dallas'. The breadcrumb trail indicates the current location: 'Deployment spaces / Research Agent / Research Agent /'. The main header for the 'Research Agent' deployment shows a green checkmark for 'Deployed' and a grey pill for 'Online'. Below this, there are tabs for 'API reference', 'Test', 'Evaluations', and 'Preview', with 'Preview' being the active tab. A 'New chat +' button is located on the right side of the chat area.

The chat history shows a user message at 07:05 PM: 'Summarize recent research on quantum computing.' The AI agent's response, also at 07:05 PM, begins with 'Based on the search results, recent research on quantum computing includes:' followed by a bulleted list of five topics: 'Advances in quantum computing hardware', 'Quantum computing for machine learning', 'Exotic forms of matter for quantum computing', 'Open-source programs for quantum physics', and 'Quantum information systems'. A text input field at the bottom of the chat area contains the placeholder text 'Type something...'. On the right side, a sidebar titled 'About this deployment' provides details about the agent, including its name, description, deployment ID, serving name, software and hardware specifications, and the associated asset 'Research Agent'.

Research Agent ✓ Deployed Online

API reference Test Evaluations **Preview**

New chat +

A You 07:05 PM
Summarize recent research on quantum computing.

Research Agent 07:05 PM
Based on the search results, recent research on quantum computing includes:

- **Advances in quantum computing hardware:** Researchers have made significant progress in developing new quantum computing hardware, such as IBM's quantum computers and Google's Willow quantum chip.
- **Quantum computing for machine learning:** Studies have shown that even small-scale quantum computers can enhance machine learning performance using novel photonic quantum computing techniques.
- **Exotic forms of matter for quantum computing:** Physicists have predicted the existence of exotic forms of matter that could have potential applications in quantum computing.
- **Open-source programs for quantum physics:** New open-source programs have been developed to help researchers obtain results in record time, and to facilitate the development of quantum computing applications.
- **Quantum information systems:** Research has focused on the development of quantum information systems that could

Type something...

About this deployment

Name
Research Agent

Description
AI research assistant that summarizes papers, finds references, and helps draft reports using IBM

Deployment Details
Deployment ID: f67bb9f4-a9e3-46...
Serving name: No serving name.
Software specification: runtime-24.1-py3.11
Hardware specification: Extra extra small: 1 CPU and 2 GB RAM
Copies: 1

Tags
wx-agent

Associated asset
Research Agent
6cd8bf8c-be5b-4e32-a57a-8099f2ad2a37

CONCLUSION

- The Research Agent streamlines academic workflows by automating literature search, summarization, and citation tasks.
- It uses **IBM Granite**, **Watson Discovery**, and **IBM Cloud Lite** for robust and scalable performance.
- Retrieval-Augmented Generation (RAG) enables intelligent, context-aware responses to research queries.
- The tool increases research productivity, reduces manual effort, and helps users make informed decisions.
- It is especially useful for students, educators, and R&D professionals seeking accurate, fast, and organized information.

FUTURE SCOPE

- **Multilingual Support** – Serve users in local and regional languages to enhance accessibility.
- **Mobile App** – Enable portable research access on Android and iOS devices.
- **Notification Alerts** – Notify users of upcoming deadlines, newly published papers, or relevant research updates.
- **PDF and Bibliography Downloads** – Allow users to export research summaries, citations, and search results.
- **Form Assistance** – Assist users in filling out research paper submissions or grant application forms.

IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



ASTHA TAYADE

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/1cac7c52-3285-43d7-b4b1-eb5561e808bf>



IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

ASTHA TAYADE

for the completion of

**Lab: Retrieval Augmented Generation with
LangChain**

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 04 Aug 2025 (GMT)

Learning hours: 20 mins



Git hub link : <https://github.com/asthatayade/A-Research-Agent/blob/main/README.md>



THANK YOU