
IBM AICTE PROJECT

RESEARCH AGENT

PRESENTED BY : ANURAG SWAIN

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ENGINEERING**

Research Agent –

AI-Powered Assistant for Academic Research

IBM SkillsBuild
Watson AI Studio Project

Presented by: Anurag Swain

github.com/HUNTER-X0s/ResearchAgent



OUTLINE




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

PROBLEM STATEMENT

❖ The Challenge

Researchers, students, and professionals often struggle to stay updated with the rapidly growing volume of academic publications, technical articles, datasets, and evolving research trends.

•The manual process of reviewing, filtering, and synthesizing vast academic content is:

-  Time-consuming
-  Inefficient
-  Prone to missing relevant insights

The growing information overload limits innovation and slows down R&D productivity.

PROBLEM STATEMENT

❖ Solution :-

- Proposed
- 💡 AI Research Agent
An AI-powered assistant that leverages:
- Natural Language Processing (NLP)
- Retrieval-Augmented Generation (RAG)
- IBM Watsonx.ai Studio
- To help users:
 - ✓ Perform efficient literature reviews
 - ✓ Generate contextual summaries
 - ✓ Identify research gaps
 - ✓ Recommend relevant papers, datasets, or collaborators
 - ✓ Interact through a **chat-based interface**

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

- From PPT's *Wow factor*:
- Make a visually appealing Markdown list with checkmarks ✓
- Example:
- ✓ Semantic search
- ✓ Auto-summarization
- ✓ Citation & reference analysis
- ✓ Paper recommendations
- ✓ Trend analysis
- ✓ Collaboration mapping

END USERS

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

RESULTS

Projects / ANURAG's sandbox / Agent Lab

Share feedback β Unsaved New agent + Deploy

Build

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

Setup




Name

watsonx Agent


Description 56/100

Change this description to reflect your particular agent

Icon



Placeholder image



Quick start questions

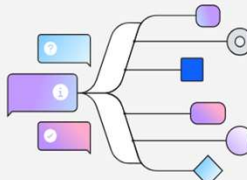
Add up to 4 quick start questions that your users can select. +



Agent preview

watsonx Agent 05:10 AM

Welcome to watsonx Agent

Change this description to reflect your particular agent



Type something...  

RESULTS

Projects / ANURAG's sandbox / Agent Lab

Share feedback β Unsaved New agent + Deploy

Build

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

Icon

Placeholder image

Quick start questions

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

what is nlp?

what is machine learning?

what is ai?

what is deep learning?

Configuration ^

Agent preview

Welcome to watsonx Agent

Change this description to reflect your particular agent

Sample questions

what is nlp? →

what is machine learning? →

what is ai? →

what is deep learning? →

Type something...

RESULTS

Projects / ANURAG's sandbox / Agent Lab

Share feedback β Unsaved 📁 New agent + Deploy 🚀

Build

AI Model: llama-3-3-70b-instruct ⌵ ⚙️ ⏪

Configuration

Framework Architecture

LangGraph ⌵ ReAct ⌵

Instructions Advanced configuration

You are a helpful assistant that uses tools to answer questions in detail.
When greeted, say "Hi, I am watsonx.ai agent. How can I help you?"

Knowledge ⌵

Tools ⌵

Add a tool Create custom tool

Added tools (1)

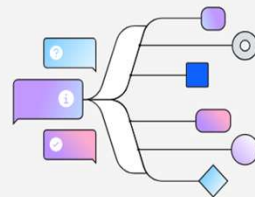
Google search ⚙️ 🗑️

Retrieve information from the internet with the Google search engine.

Agent preview

Welcome to watsonx Agent

Change this description to reflect your particular agent



Sample questions

what is nlp? ➔

what is machine learning? ➔

what is ai? ➔

what is deep learning? ➔

Type something... 🗨️ ➤

RESULTS


Projects / ANURAG's sandbox / Agent Lab

Share feedback β Unsaved 📁 ⌵ New agent + Deploy 🚀

Select a tool

Choose a tool to add to your agent.


🔍 Search for a tool



Google search

Retrieve information from the internet with the Google search engine.


☒



DuckDuckGo search

Retrieve information from the internet with the DuckDuckGo search engine.


☐



Wikipedia search

Retrieve information from Wikipedia articles.


☐



Document search

Search documents with vector indexes.


☐



Tavily search

Retrieve information from the internet with the Tavily search engine.


☐



Webcrawler

Retrieve information from a website.


☐



Python Interpreter 🟡

Execute Python code generated by the agent.

☐



Weather

Retrieve the weather of a city.

☐

edunet
foundation

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:

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

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:

1. **Hypothesis: Plants grow taller when they receive more sunlight.**

- **Independent Variable:** Amount of sunlight received.
- **Dependent Variable:** Height of the plants.
- **Source:** [Brainly](#)

2. **Hypothesis: Light helps plants grow.**

- **Prediction:** If I put my plants in the warm sun, they will grow faster.
- **Source:** [LinkedIn - Lukas Vermeer](#)

3. **Hypothesis:** If plants receive more sunlight, then they will be taller than those receiving less light.

Type something...



CONCLUSION

- The Research Agent developed in this project represents a significant step toward transforming the way researchers interact with academic and scientific information. By leveraging the capabilities of **IBM Watsonx.ai** and the **Granite Large Language Model**, the system delivers more than just answers — it provides context-aware insights, concise literature summaries, and structured academic reports.
- This solution addresses the pressing challenges of information overload, time-intensive literature reviews, and fragmented research workflows. By integrating summarization, Q&A, and literature synthesis into a single intelligent agent, we have created a tool that not only saves valuable research time but also enhances the quality and accuracy of knowledge extraction.

CONCLUSION

- The interactive interface, cloud-based architecture, and modular design ensure that the system is accessible, scalable, and adaptable to future advancements. Whether for **students preparing academic papers**, **researchers exploring new fields**, or **industry experts analyzing technical domains**, this Research Agent stands as a reliable AI companion for the modern knowledge era.
- With future enhancements such as **multilingual support**, **voice-assisted interaction**, **real-time collaboration**, and **research gap analysis**, this project holds the potential to become a comprehensive AI-powered research ecosystem.
- In conclusion, the Research Agent is not just a demonstration of technical implementation — it is a **practical, forward-looking solution** that aligns with the evolving needs of academia and industry, paving the way for faster, smarter, and more impactful research.

GITHUB LINK

GitHub Link : - https://github.com/HUNTER-XOs/RESEARCH_AGENT/tree/main

🚀 Research Agent – IBM SkillsBuild Project

An AI-powered assistant built in **IBM Watsonx.ai Studio** using the **Granite Large Language Model** to help researchers summarize literature, answer academic questions, and generate structured research reports.

📌 Features

- 📄 Summarize research papers or articles
- 💬 Chat-based Q&A for academic queries
- 📝 Generate literature reviews
- ☁️ Runs fully on IBM Watson Cloud (no local CPU load)

🚀 How to Run

1. Open in **IBM Watsonx.ai Studio**.
2. Set your credentials in the first cell:

FUTURE SCOPE

- From your PPT's *Future scope*:
- Multilingual support
- Voice-activated assistant
- Real-time collaboration
- Research gap detection
- Integration with publishing platforms
- AI-assisted drafting

IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



ANURAG SWAIN

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/19935f7e-0d2e-4f1c-8b70-f3955709ded2>



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IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

ANURAG SWAIN

for the completion of

**Lab: Retrieval Augmented Generation with
LangChain**

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 16 Jul 2025 (GMT)

Learning hours: 20 mins

IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

ANURAG SWAIN

for the completion of

Large Language Model Basics

(MDL-433)

According to the Moodle system of record

Completion date: 16 Jul 2025 (GMT)

Learning hours: 30 mins

THANK YOU