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# **IBM AICTE PROJECT**

## **RESEARCH\_AGENT\_AI**

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# OUTLINE

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- **Conclusion**
- **Git-hub Link**
- **Future Scope**
- **IBM Certifications**

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# PROBLEM STATEMENT

**Example:** In today's fast-paced academic and industrial research environments, professionals face significant challenges in managing large volumes of scientific literature, extracting relevant insights, and organizing references efficiently. Tasks such as literature review, research paper summarization, citation management, and hypothesis generation are often **time-consuming, repetitive, and prone to error**. These inefficiencies not only delay the research process but also limit innovation and data-driven decision-making.

There is a pressing need for an intelligent, autonomous system that can **understand research intent**, retrieve relevant scholarly content, generate concise summaries, and assist in organizing research workflows. The goal is to build a smart, interactive AI agent that can accelerate the research lifecycle, reduce manual effort, and improve the overall quality and impact of academic output.

# SOLUTION STATEMENT

To address the inefficiencies in academic research workflows, we propose the development of an **AI-powered Research Agent** that automates key research tasks such as literature search, paper summarization, and reference management. Leveraging **Natural Language Processing (NLP)** and **Retrieval-Augmented Generation (RAG)**, the agent will:

- Understand user queries in natural language and retrieve contextually relevant academic papers from trusted sources.
- Generate concise, accurate summaries and highlight key insights to reduce time spent on manual reading.
- Organize references and citations using standardized formats (APA, IEEE, etc.), and assist in hypothesis generation or report drafting.

This intelligent agent will be deployed using **IBM Cloud Lite services** and powered by **IBM Granite models**, ensuring secure, scalable, and enterprise-ready AI performance. The solution aims to boost productivity, reduce cognitive load, and foster innovation in academic and industrial R&D environments.

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# TECHNOLOGY & CLOUD SERVICES USED

- IBM cloud lite services
- Natural Language Processing (NLP)
- Retrieval Augmented Generation (RAG)
- IBM Granite model
- IBM Watsonx AI Studio
- IBM Watsonx AI Runtime
- IBM Cloud Agent Lab
- IBM Granite Foundation model

# WOW FACTOR

This AI Research Agent revolutionizes academic and industrial research by:

- **Reducing research time** and improving literature review quality.
- **Auto-summarizing** selected papers and generating actionable insights.
- **Recommending relevant papers** and datasets based on user queries.
- **Identifying research gaps** and suggesting novel topics.
- **Enabling collaboration** by mapping potential co-authors or institutions.

## Unique Features:

- Semantic search across research papers and journals.
- Citation and reference analysis.
- Trend analysis for specific keywords or domains.

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# END USERS

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

# RESULT

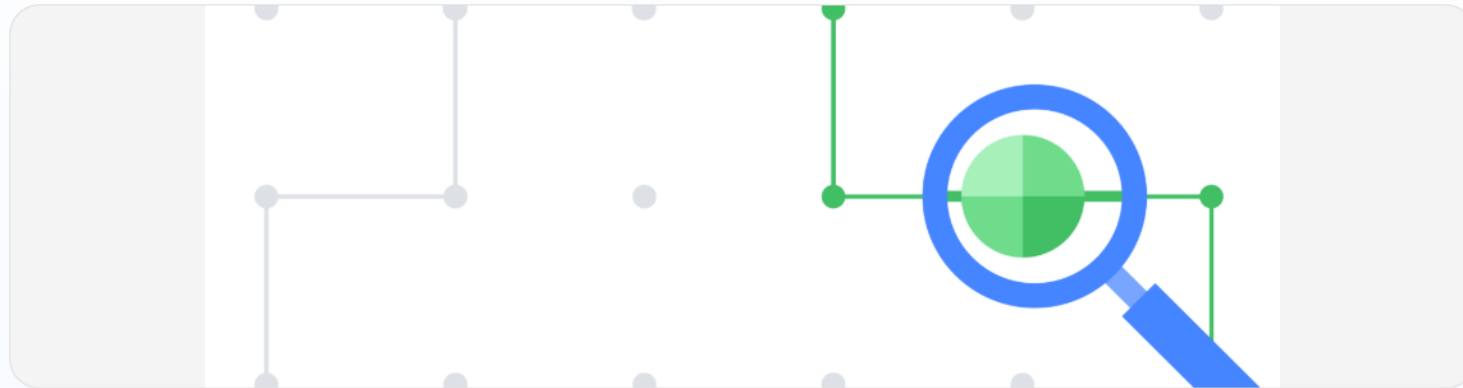
## Agent preview



watsonx Agent 11:39 AM

Welcome to watsonx Agent

Change this description to reflect your particular agent



Type something...





# RESULT

## Agent preview



You: 11:42 AM

can you tell me the working principal of this project?



watsonx Agent 11:42 AM

The working principle of the project involves a stress detection system designed to predict stress in IT professionals using image processing and machine learning techniques. The system is divided into three modules:

1. **Employee Registration and Alerts:** This module registers the employee, sends alerts, and later provides survey forms.
2. **Image Capturing and Processing:** This module works on capturing images, converting the image into coordinates, and then mapping the image to get a prediction about stress.
3. **Data Conversion and Stress Level Detection:** This module converts data into binary values based on which stress levels are detected. Based on the stress level, solutions are provided for overcoming stress.

Type something...



# RESULT

## Agent preview



You: 11:46 AM

can u show me any recent research papers or articles that are published based on Stress Detection in IT Professionals by Image Processing and Machine Learning?



watsonx Agent 11:46 AM

Here are some recent research papers and articles on stress detection in IT professionals using image processing and machine learning:

### 1. Detection of Stress by Machine Learning in IT Industry

- **Abstract:** The primary goal of our design is to reduce stress among IT professionals by combining graphical technology literacy and image processing techniques.
- **Link:** [IEEE Document](#)

### 2. Stress Detection in It Professionals by Image Processing and Machine Learning

- **Description:** Advanced machine learning algorithms and image analysis techniques will be utilized to extract

Type something...



# RESULT

## Agent preview



You: 11:54 AM

can u tell me the working principal of this project in a step by step process from starting (Developing) to ending (Deployment) ?



watsonx Agent 11:54 AM

Sure, here is a step-by-step process for developing and deploying a stress detection system for IT professionals using image processing and machine learning:

### Step 1: Problem Definition and Requirements Gathering

- **Define the Problem:** Clearly outline the problem you are trying to solve, which is detecting stress in IT professionals.
- **Gather Requirements:** Identify the key requirements such as image capturing, stress level detection, and providing solutions.

### Step 2: Data Collection

Type something...



# RESULT

[Deployment spaces](#) / [RESEARCH\\_AGENT\\_AI](#) / [watsonx Agent](#) /



watsonx Agent ✓ Deployed Online

[API reference](#)

[Test](#)

**[Preview](#)**

[New chat](#) +



You 01:33 PM

can u list out the algorithms that are required or used for this project?



watsonx Agent 01:33 PM

Based on the search results, the following algorithms are required or used for this project:

1. Sorting and searching algorithms (e.g. merge sort, bubble sort)
2. Hash table algorithms
3. Machine learning algorithms (e.g. deep learning, neural networks)

Type something...



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# CONCLUSION

The AI Research Agent:

- It saves time by Automates repetitive tasks like citation management and data extraction.
- The Agent can generate reports, suggest hypotheses, and even draft sections of each research papers.
- Enhances efficiency, accuracy, and innovation in research.
- Supports both academic and industrial R&D with scalable solutions.

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## GITHUB LINK

GitHub Link :- [Link](#)

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# FUTURE SCOPE

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

# IBM CERTIFICATIONS

Screenshot/ credly certificate( getting started with AI)





# IBM CERTIFICATIONS

Screenshot/ credly certificate( Journey to Cloud)



# IBM CERTIFICATIONS

Screenshot/ credly certificate( RAG Lab)





**THANK YOU**