

AI and CMMS:

When Robots Meet Maintenance...
It's Not as Scary as It Sounds!



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Software Development for 15+ Years

Husband for 10+ Years

Dad for 8 years

Favorite Emoji: 🚀

Random Factoid: Played in 2018 Disc
Golf Am Worlds Championship

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<https://github.com/stuisme>

Agenda

Part 1: Presentation

- What is AI?
- Various types of AI
- What can I do now?
- Future of AI

Part 2: Hands-on

- Basic Training
- Group Activities
- Homework

Quick Questions??

How often do you use AI today?

What AI technologies do you use?

Do you feel negatively towards AI?

How does AI work?

Simply defined:

AI is a set of algorithms and data for computers to recognize patterns, make predictions, and assist with tasks.

A group of algorithms, data, and learning techniques are used to train and create something called a model.

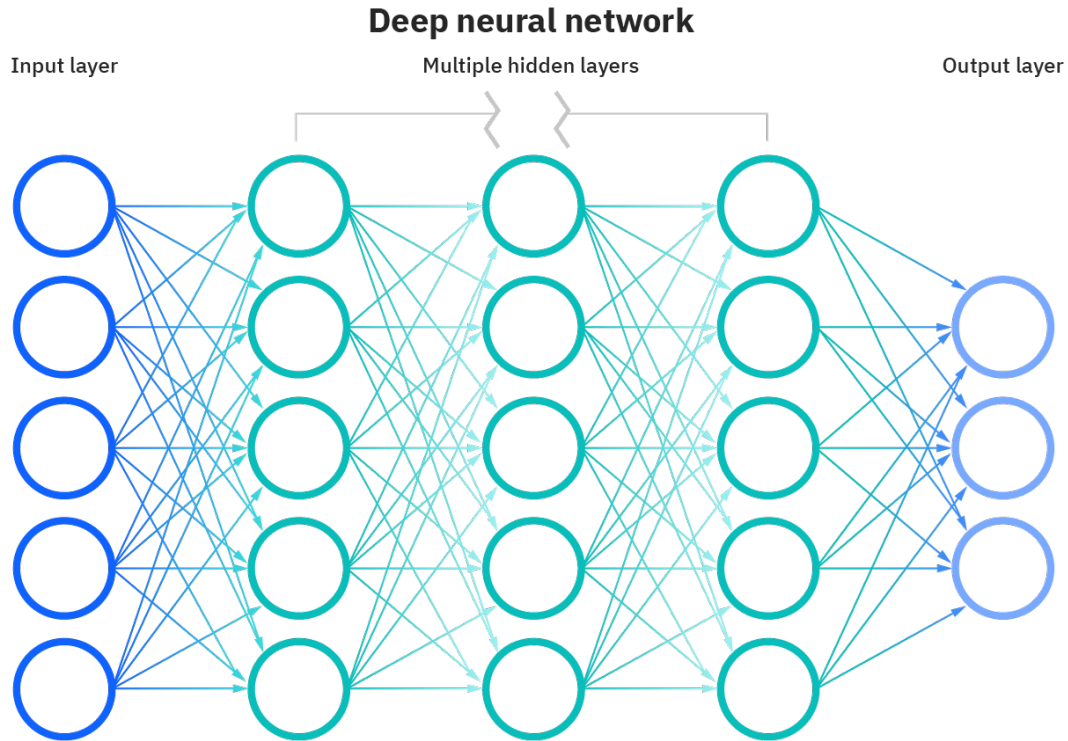
Importantly, there are several kinds of models

✗ Not several of
these





Lots and lots of these



What technology exists today?

Classification Models

Trade / Category for a work order

User sentiment on a work order

Priority Labeling

Duplicate Detection

Category ✨

Search Category...

AI Suggestions

PL	Plumbing	✨
PL:DRN	Drainage	✨
PL:LEAK	Water Leaks	✨

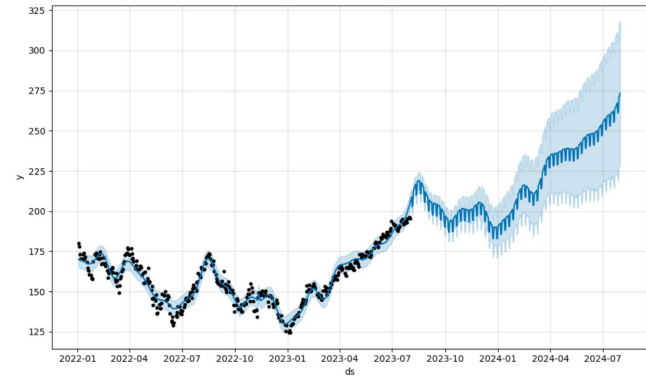
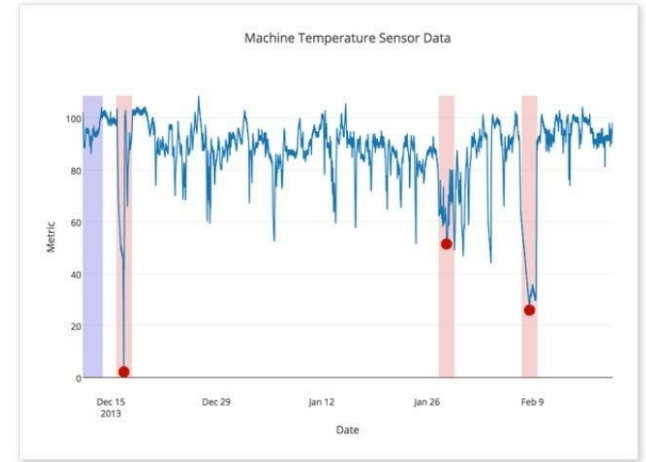


Regression Models

Helpful for Building Automation and IoT data for predictive analytics

Workforce management can benefit from predictions of people hours required for maintenance based on seasonality

Inventory level predictions and cost analysis



Computer Vision Models

Object detection - Anomalies as well

Facial Recognition - Safety and Workforce authorization

OCR - Nameplate, receipts, deposit a check, etc

Barcode/ QR Code using Cameras

Verify Information

New Asset



Asset Fields

Name

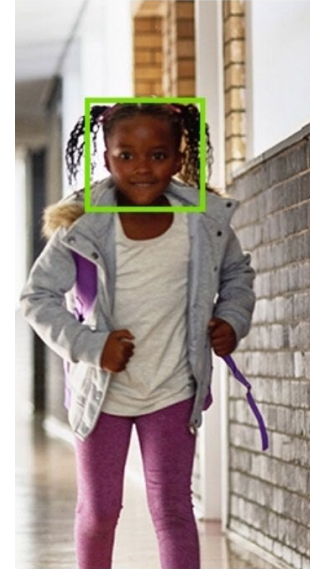
Gas-Fired Heating Boiler

Tag / Alternate ID

TX * 246985 *



Reuse existing labels, barcodes or QR codes



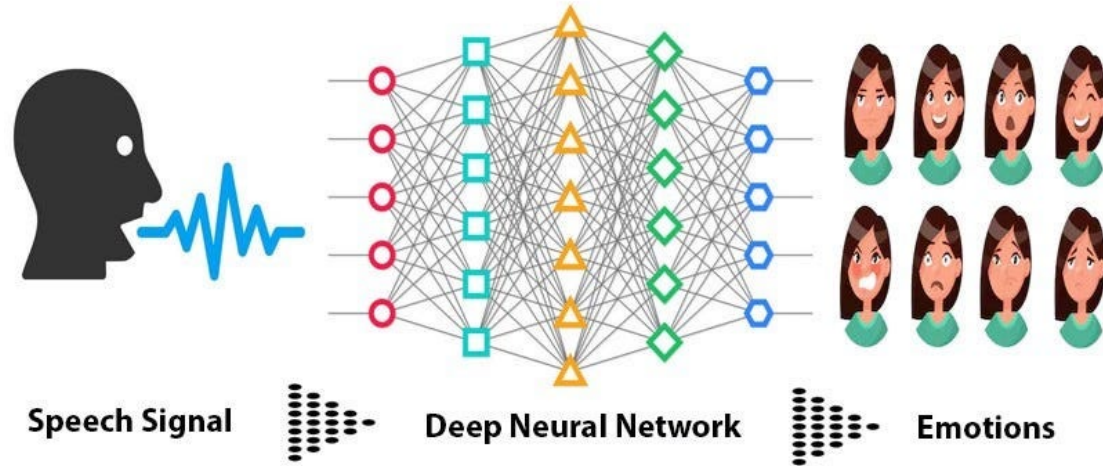
Computer Hearing Models

Equipment sound anomalies

Gunshot detection

Intrusion detection

Emotional detection



Agentic Multimodal Large Language Models

AI Agent Examples

Perform context aware actions. Built on the foundations of other LLM capabilities.

“We finished the yearly maintenance procedures, run this generator’s test and optimize engine timings. Once all is good, log the test results on the ticket then close the work order w/ 4 hours labor”

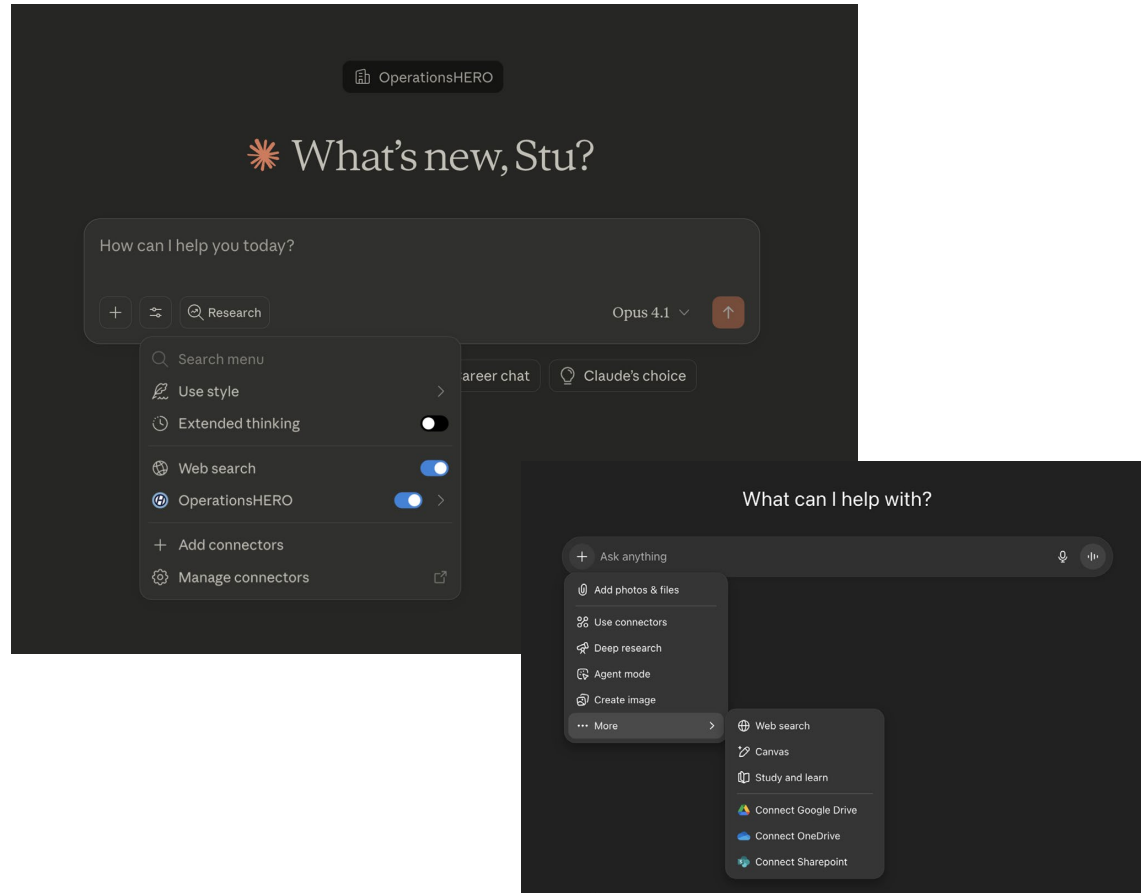
	LLM
	LLM + Planning
	LLM + Planning + Memory
	Agents (LLM + Planning + Memory + Tools)

Connectors

The foundation for AI ecosystems and agents.

They allow several tools to work together.

A new standard called Model Context Protocol (MCP) has enabled this.



Connectors Example

M Create a bar chart showing work order volume by building for the last 30 days. Then create another chart showing average completion time by building. Ask which building needs help.

I'll help you create those charts for your OH_Hero Schools account. Let me first fetch the work order data from the last 30 days and analyze it by building.

Find requests

Let me fix that by properly specifying the date range for the last 30 days:

Find requests

Now let me get the remaining requests with pagination to ensure we have all data from the last 30 days:

Find requests

Let me get the third page to complete the data collection:

Find requests

Now I have all the data I need. Let me process it to create the visualizations. I'll analyze work order volume by building and calculate average completion times.

Analyzed data View analysis

Analyzed data View analysis

Let me fix the code:

Analyzed data View analysis

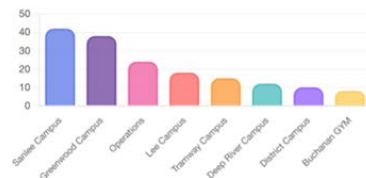
Let me create the artifacts with the charts instead:

Work Order Analysis Dashboard
Interactive artifact

Perfect! I've created two comprehensive bar charts for your OH Hero Schools work order analysis:

OH Hero Schools - Work Order Analysis Dashboard

Work Order Volume by Building (Last 30 Days)



Average Completion Time by Building (Hours)



Building Needing Immediate Attention

LEE CAMPUS

This building has the longest average completion time at **72.3 hours** (3 days).

72.3

Avg Hours to Complete

18

Total Work Orders

53.8

Hours Above Best Building

Recommendations:

- Allocate additional maintenance staff to Lee Campus
- Review work order types for complexity patterns
- Consider preventive maintenance to reduce corrective work orders
- Investigate potential resource or equipment constraints

Deep Research

Some AI's can search the Web and compare several sources together

Takes a bit longer to run, but is supposed to have a higher accuracy and source citations.

The screenshot displays the Gemini web interface. At the top, the Gemini logo and 'Deep Research with 2.5 Pro' are visible. A 'Start research' button is present. Below it, a message states: 'I've completed your research. Feel free to ask me follow-up questions or request changes.' A card titled 'High School Security System Overhaul' with a timestamp of 'May 12, 11:00 PM' is shown. At the bottom left, there is a prompt input field with the text 'Enter a prompt for Gemini' and a 'Deep Research' button. A disclaimer at the bottom reads: 'Your operationshero.com chats aren't used to improve our models. Gemini can make mistakes, so double-check it. [Your privacy & Gemini](#)'.

The main content area displays a report titled 'High School Security System Overhaul' with an 'Export to Docs' button. The report includes the following sections:

- Estimated Costs for Comprehensive High School Security System Overhaul**
- I. Executive Summary**
 - Purpose of the Report:** This report provides a detailed estimation of the costs associated with a comprehensive overhaul of security systems for a typical U.S. high school. It includes initial investment for hardware, software, and installation, as well as projected support and service costs over a five-year period. The estimates herein are designed to assist school administrators and stakeholders in financial planning, decision-making, and potential grant applications for enhancing campus safety and security.
 - High-Level Cost Summary:** The estimated total initial investment for the security system overhaul, as detailed in this report for a model high school, ranges from approximately **\$350,000 to \$550,000**. The projected five-year Total Cost of Ownership (TCO), encompassing initial outlay and ongoing operational and support expenses, is estimated to be between **\$470,000 and \$750,000**. These figures are subject to variation based on specific school characteristics, chosen technology tiers, and prevailing market conditions.
 - Key Findings:** The analysis reveals several significant cost drivers. Hardware acquisition, particularly for video surveillance cameras and access control systems across numerous doors, constitutes a major portion of the initial investment. Installation and integration labor, especially for complex systems in existing structures, is another substantial cost factor. Furthermore, ongoing expenses, including software licenses, cloud service subscriptions, and annual maintenance contracts, contribute significantly to the long-term TCO. The choice between proprietary, all-in-one solutions and open-platform systems also has profound implications for both upfront and recurring costs, as well as long-term flexibility.
 - Core Recommendations:** A strategic approach to this security upgrade is

Vision in LLMs

Parse text out of images
Analyze images for specific
questions



whats wrong with this unit?



Show thinking ▼

Based on the image provided, the main issue with this unit appears to be severe damage to the electrical windings. The insulation around the copper wire is degraded and discolored, indicating significant overheating. This is likely caused by an electrical fault such as an overload or short circuit, which has led to the breakdown of the winding insulation and potential failure of the component.



Truth Grounding

AI can provide references for the content. You might have to ask.

Source material may not be reputable.

Troubleshooting Steps:

1. **Check the Transfer Switch:** Verify its settings and connections.
2. **Inspect the Generator:** Examine the fuel level, battery, engine, and controller.
3. **Test the Generator Manually:** Try starting the generator manually to see if it functions.
4. **Consult the Manual:** Refer to your generator's manual for specific troubleshooting guidelines.

If you're unable to resolve the issue yourself, it's recommended to contact a qualified technician to inspect and repair your generator.

Would you like me to provide more specific troubleshooting steps based on your generator model or any error codes you might be seeing?

Sources and related content ^ ⓘ

Generac Generator Won't Start.
How to Fix Fast? (Expert Tips)



csdieselgenerators.com



Basics Of Backup Generator
Troubleshooting - Townsend...



www.townsendtotalenergy....



How does c
Home St >



support

Other LLM Examples

Summarize some text

Analyze data and documents

Generate ideas for things

General Reasoning Capabilities



What are some ideas for speaking topics on the future of AI in Facility Manage

Show dra



Speaking Topics on the Future of AI in Facility Management

Here are some potential speaking topics that delve into the future of AI in facility management:

General Trends and Applications

- **AI and the Smart Building:** Exploring how AI will transform buildings into intelligent, self-regulating environments.
- **The Role of AI in Predictive Maintenance:** Discussing how AI can predict equipment failures, reducing downtime and costs.
- **AI-Powered Energy Management:** Examining how AI can optimize energy consumption and reduce carbon footprints.
- **AI for Enhanced Occupant Experience:** Exploring how AI can improve occupant comfort, safety, and productivity.

Specific Use Cases

- **AI for Space Optimization:** Discussing how AI can optimize space utilization and reduce costs.
- **AI-Driven Facility Security:** Exploring how AI can enhance security measures through facial recognition, anomaly detection, and threat analysis.

How will AI agents and ecosystems
help me in the future?

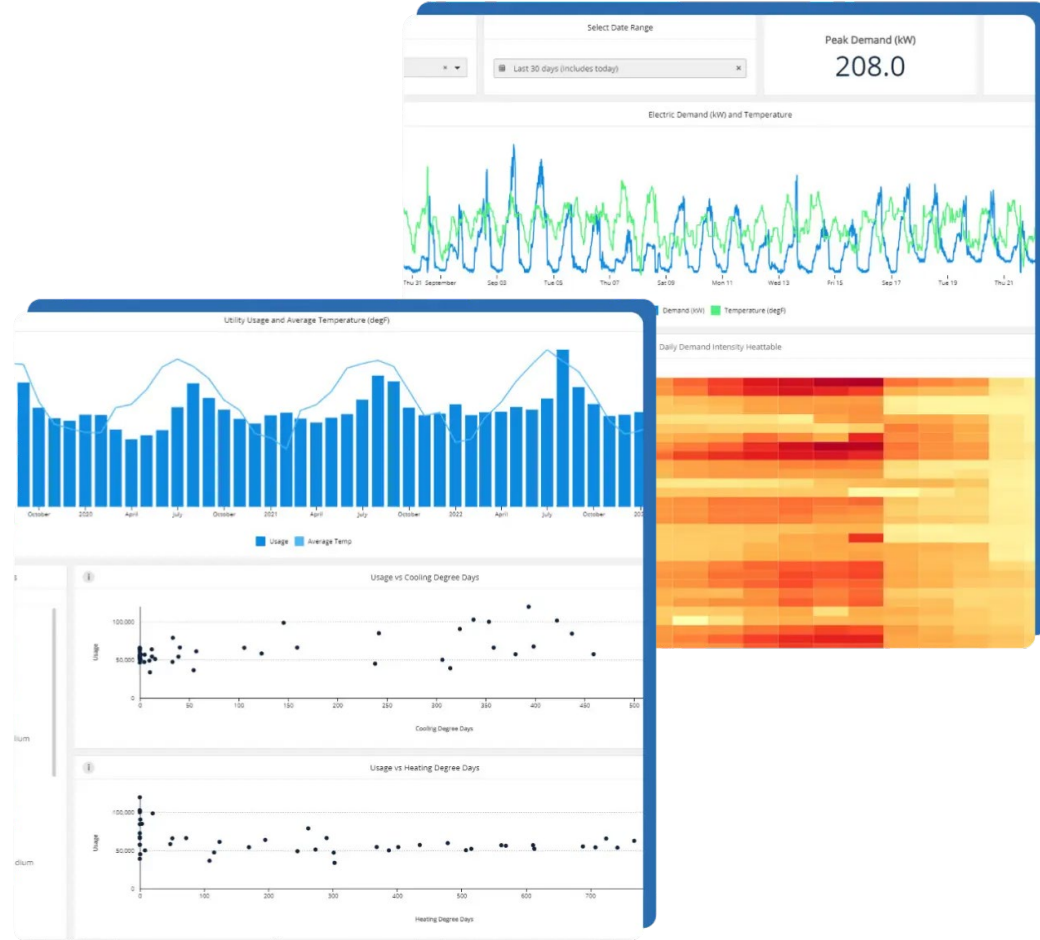
Energy Optimizations

Energy and Utility Usage Anomaly Detection

Usage Predictions including seasonality for budgeting.

Automated insights into usage optimizations (i.e. Carbon footprint)

Building Automation Agents, with energy and water usage optimizations.



Predictive Maintenance

IoT and Smart building sensors can provide data to systems used to predict future state of the equipment to anticipate problems in advance.

Historical work order data can provide seasonal maintenance trends that indicate typical failures.

Computer hearing and vision can detect subtle changes to machinery, predicting failure.

Operational Assistance

Smart Dispatching - Understand people skills, workloads, and proximity to route work accordingly

Field use AI's can help with troubleshooting, parts dispatching and installation guides using multi-modal features.

Agents can help with bulk tasks - For example, after a storm, ask the AI to create a work order for every school building and associated it with a FEMA budget code for tracking.

Real-Time Alerts and Recommendations

Imagine an alert from your building systems on a piece of equipment.

If an automated fix is possible, AI could try with an AI Agent call.
(i.e. Restart the unit, adjusting something upstream, etc)

If not, an AI Agent could create a work order with a pre-assigned technician based trade and schedule, categorize the work for cost tracking, add a suggestion of what the issue could be including possible troubleshooting steps, ensure warehouse parts are in stock, etc.

What's next with LLMs?

Bigger and Better Context

More data can be used to find an answer

Widespread Accessibility

(More connectors, more in app AI services, integrations galore)

App Stores / Connector Registries

Educational institutions use 1000s of vendors that want in on AI...

Institutions want privacy and security, bring your own AI is the future.

Stable Economics

Not every vendor can charge \$20+ a seat to enable AI in products.

Flat fees from AI vendors for companies stabilizing unit economics.

Always on AI Agents

Lots of developer activity around agents

AI Agents Directory Landscape Categories Agencies ... More Request Submit Login

AI Agents Market Landscape

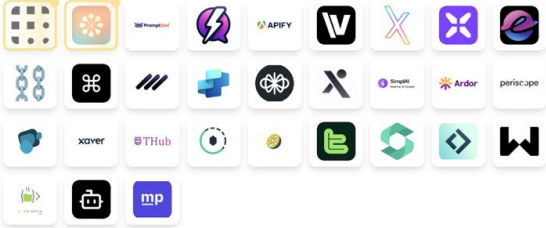
Interactive ecosystem map of AI agents, tools, and assistants

• March 2025 • Categories: 55 • Agents: 1127

☐ Free ☐ Open Source ☐ Featured ☐ Show Names

AI Agents Platform > 131

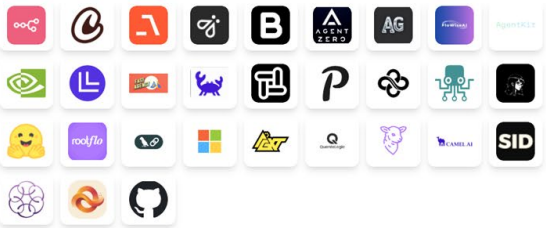
Platforms that allow users to create, customize, and deploy AI agents.



Show 101 More ▾

AI Agents Frameworks > 91

Development frameworks that help to build and deploy AI agents.



Show 61 More ▾

AI Agents will be everywhere



Final Thoughts

(Before workshop)

AI will continue to rapidly evolve.
Companies will continue to build as the
technology becomes more accessible
and standardized.

Vendors must approach AI
ethically and responsibly

Thanks for all you do to help
our families and our communities

Workshop Group Activities

Try it out on your devices

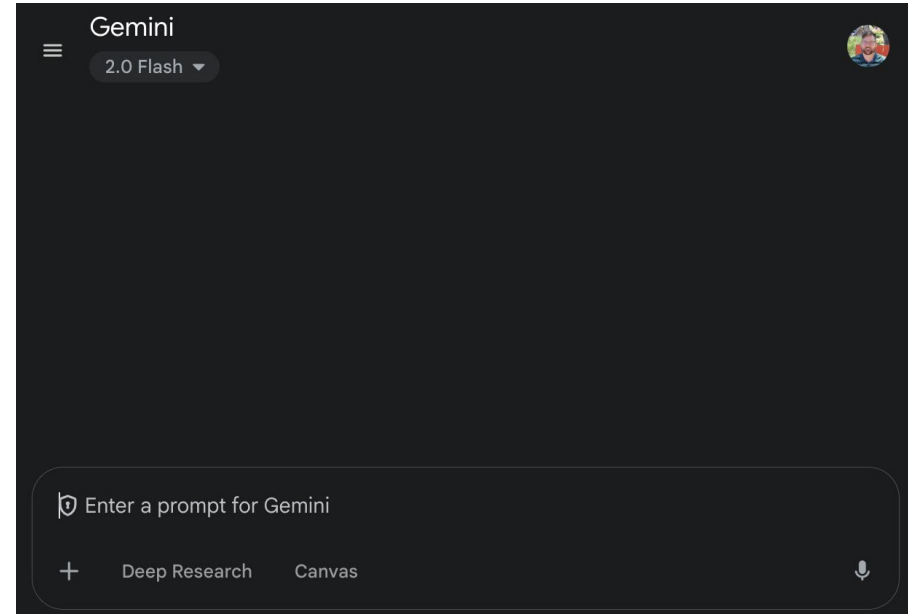
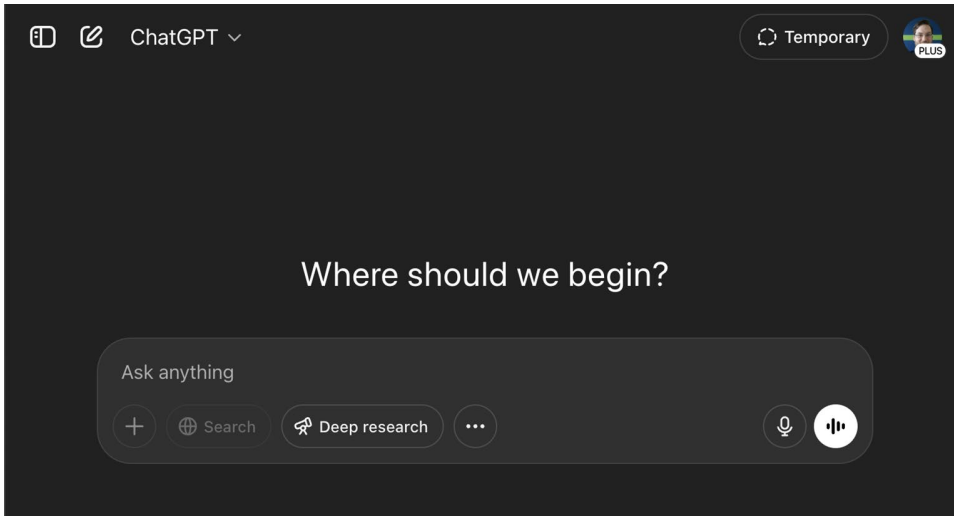
<https://gemini.google.com/>

<https://chatgpt.com/>

<https://claude.ai/>



Interface Training



What are some tips for using LLMs?

Protect student privacy

Protect your privacy

Do NOT share names, emails, phone numbers, SSNs, online identities, images with faces, etc.

Structured text helps

Try labeling data points, be precise and concise

Additional context helps

Try rephrasing or adding more information

Get Creative

It may surprise you what it knows about.

Trust but verify

AI is good, it can be easy to trust it blindly.
It's imperfect just like people.

Group Activity - Maintenance Tasks

Discuss as a group some maintenance related tasks that require some research. Use AI to quickly find maintenance info

Create 2-3 examples as a group and try different prompts.

Some examples:

- Preventative Maintenance for a piece of equipment
- Lifecycle information for unfamiliar equipment
- Troubleshooting questions
- Parts extraction from manuals

Group Activity - Administrative

Explore how AI can assist with administrative tasks like policies, reviews, and planning.
Create 2-3 examples as a group and try different prompts.

Examples:

- Training plans and content for new staff
- Department policies and procedures
- Contract reviews
- Vendor Invoice analysis

Group Activity - Research

Explore how AI help find and summarize complex information.

Create 2-3 examples as a group and try different prompts.

Examples:

- Estimated costs for a project based on building information
- Understanding key points of a new safety regulation
- Research related to building code

Group Activity - Brainstorm ideas for homework

Use more advanced AI features such as data analytics, image processing and speech modes.

Create 2-3 ideas that you can try at home.

Examples:

- Create dispatch plan for the week based on the weather and availability of people
- Analyze multiple repair reports on an aging system to identify root causes
- Extract information from as-builts and compare to local building code
- Review and suggest revisions to internal policies for compliance of new regulations

Thanks for your valuable
time

Check out what we are building →



<https://opshero.link/intelligence>