



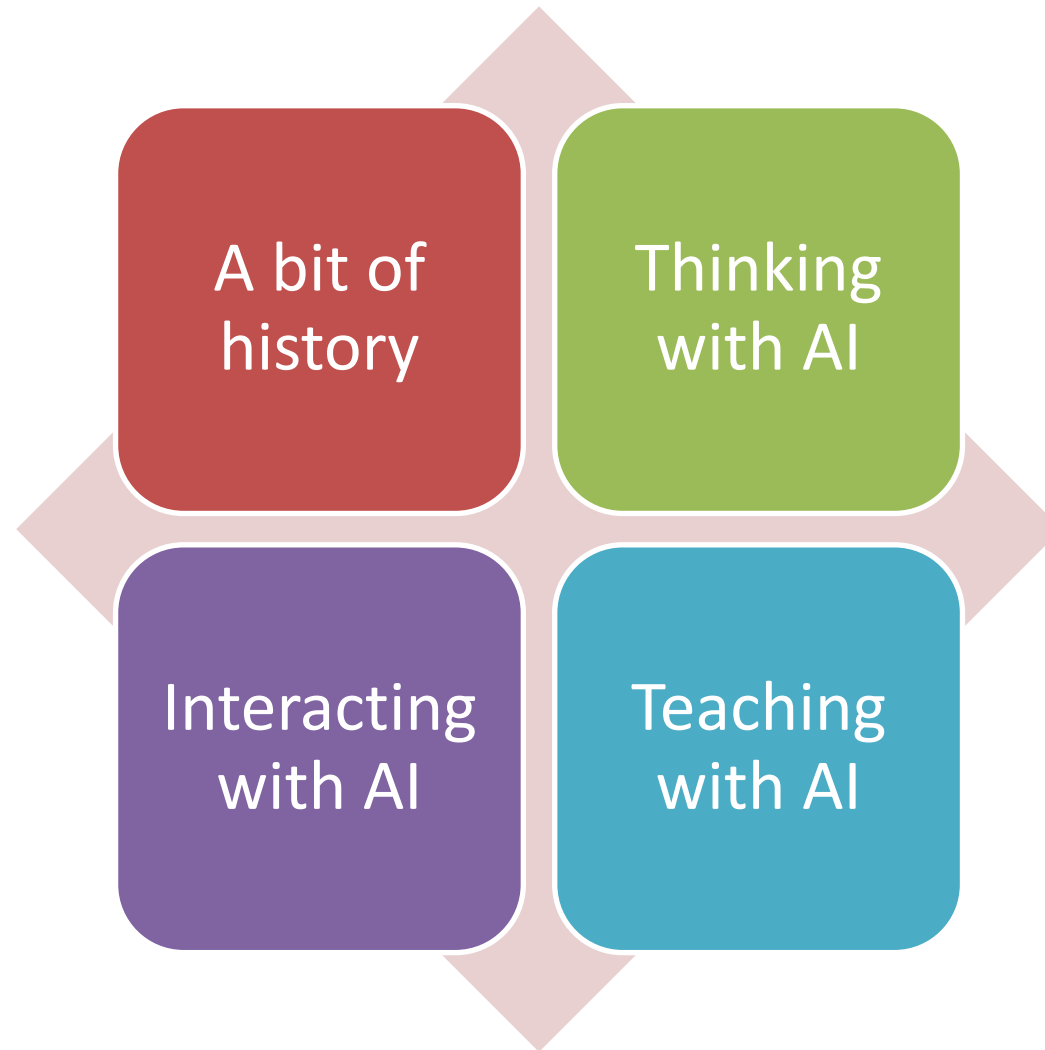
Advanced Radiation Protection School "Carlo Polvani"  
Milan, June 24-27, 2025

# AI Techniques in Education

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# Overview



# Artificial Intelligence

Field of study in computer science, which develops and studies intelligent machines

Artificial intelligence (AI) is the intelligence of machines or software, as opposed to the intelligence of humans

AI is widely used throughout industry, government, science, and everyday life

Advanced web search engines  
Google, Yahoo, ...

Recommendation systems  
YouTube, Amazon, Netflix

Understanding human speech  
Google Assistant, Siri, Alexa

Face Recognition  
Apple Face ID, Microsoft DeepFace, Google Face Net

Image Labelling  
Facebook, Tik Tok

Automatic Language Translation  
DeeL, Google Translator

Strategy games  
Chess

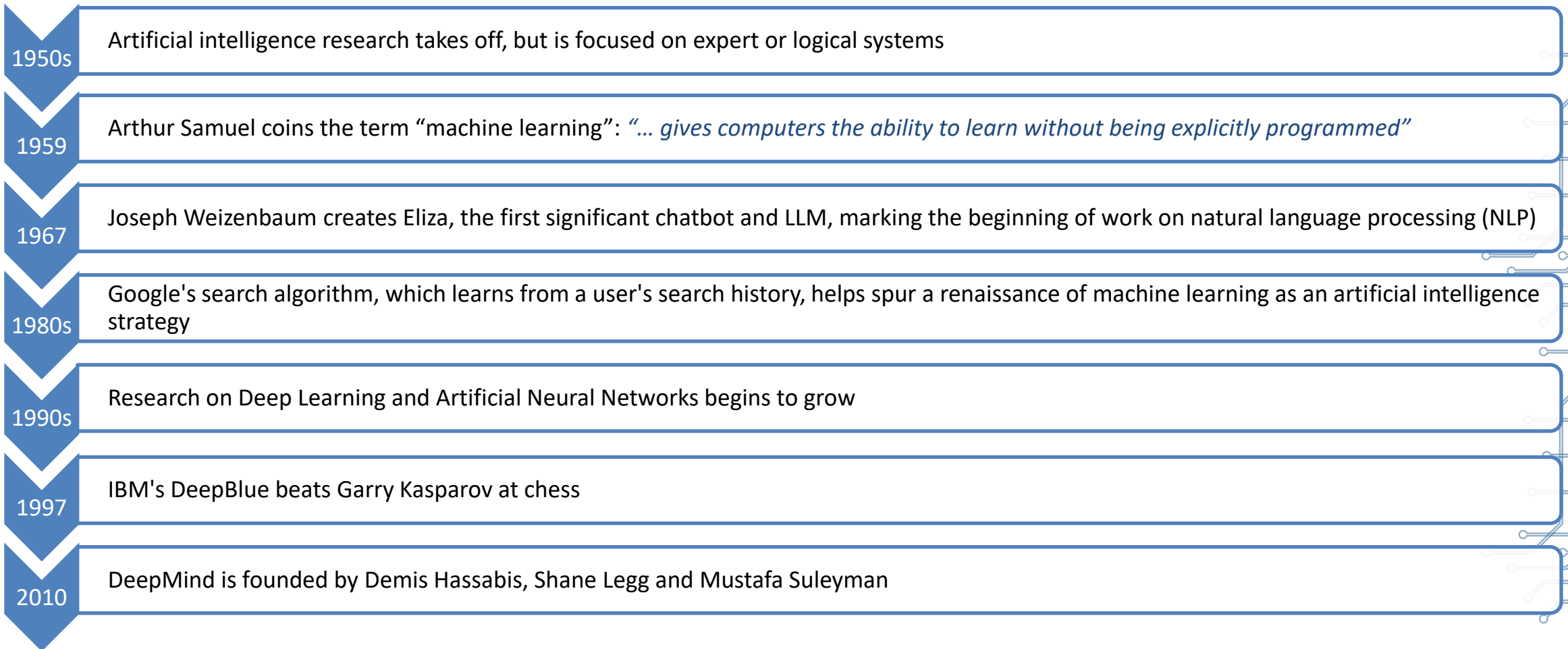
Autonomous Vehicles  
Waymo

Generative AI  
ChatGPT

Creative tools  
AI art

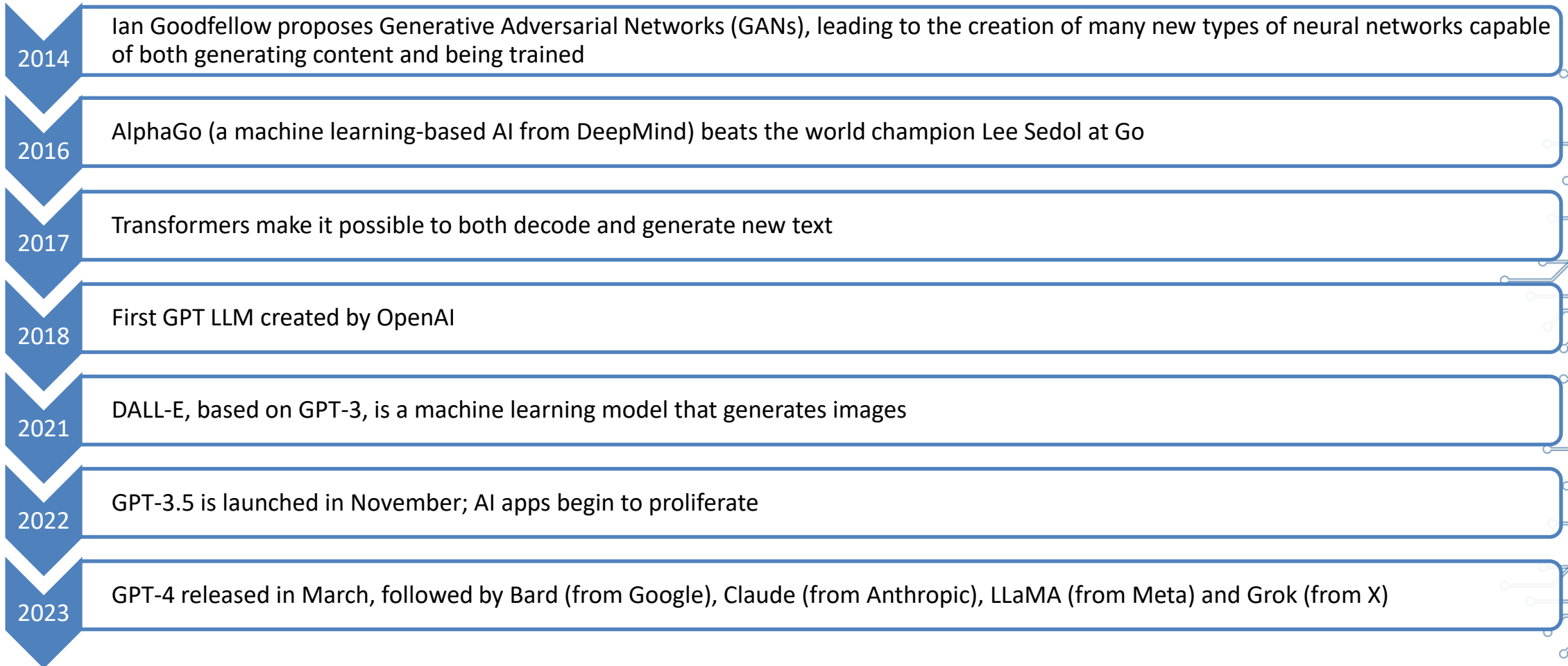
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# A bit of history



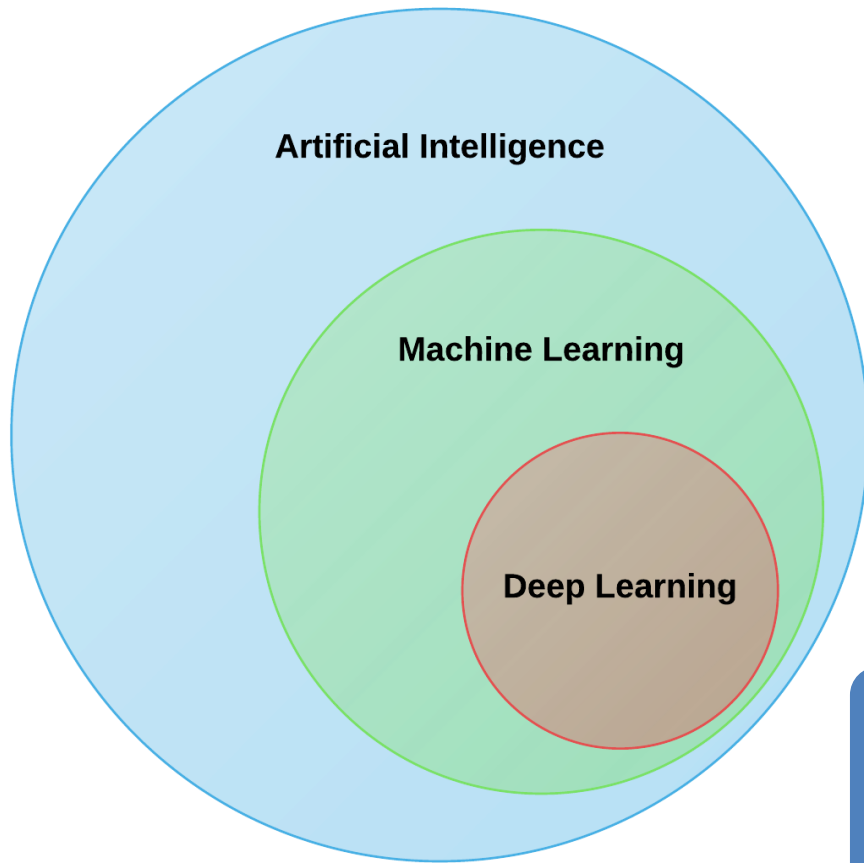
José Antonio Bowen and C. Edward Watson, «Teaching with AI», Hopkins Press, 2024

# A bit of history



José Antonio Bowen and C. Edward Watson, «Teaching with AI», Hopkins Press, 2024

# Evolution of AI



*"Machine learning is the field of study that gives computers the ability to learn without being explicitly programmed."*  
Arthur Samuel (IBM, 1959)



Instead of explicitly programming a computer to perform a specific task, you provide the computer with training data and learning algorithms that allow the computer to learn autonomously from that data and improve its performance over time

Deep Learning is a sub-area of Machine Learning that focuses on using deep artificial neural networks to learn from large amounts of data



These neural networks are mathematical models inspired by the structure of the human brain and are composed of multiple layers of artificial neurons

# Generative AI

Uses Machine Learning and Deep Learning techniques to **generate new content**, including images, music, and text, that did not previously exist

It is capable of producing complex and highly realistic content that mimics human creativity, making it a valuable tool for many industries

It can be used to create animations, reduce the development time of video games and applications, revolutionize the way information is created, and even create entire virtual worlds



# Generative Pre-trained Transformer (GPT)

## Generative

Able to generate coherent and contextually relevant content

May also generate false content (hallucinations)

## Pre-trained

Trained on large-scale text data before fine-tuning

Possible bias due to the training set

## Transformer

Probabilistic and statistical reasoning

This also causes unpredictability and unreliability



# AI Hallucination

AI hallucinations are instances where models generate plausible but incorrect or ungrounded information

Causes: Insufficient data, overgeneralization, lack of fact-checking

Impact: Erodes trust, spreads misinformation

Mitigation: Retrieval Augmented Generation (RAG), human-in-the-loop verification, and model fine-tuning



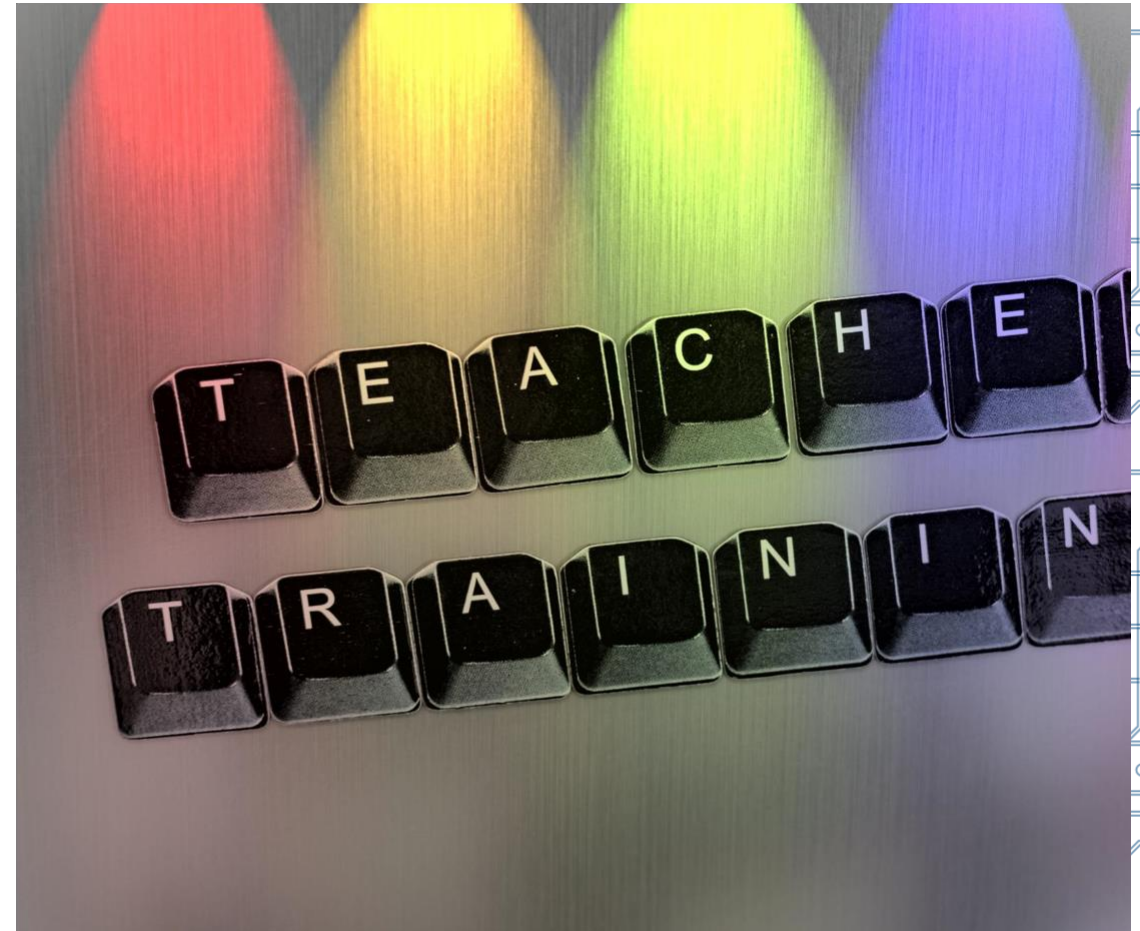
# AI Bias

Artificial intelligence is not free of human biases

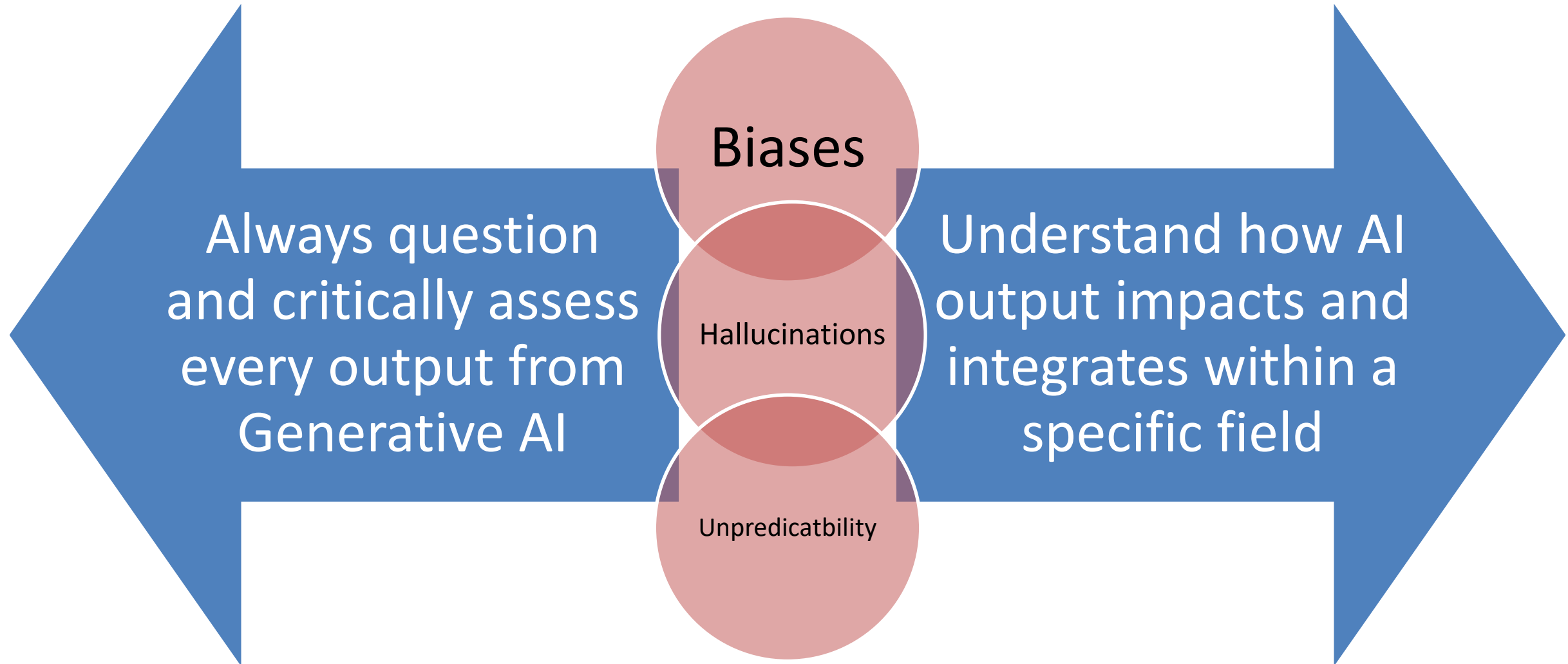
Data used for training may contain inherent biases

Such biases can lead to discriminatory decisions in areas such as hiring, lending, insurance, and law enforcement

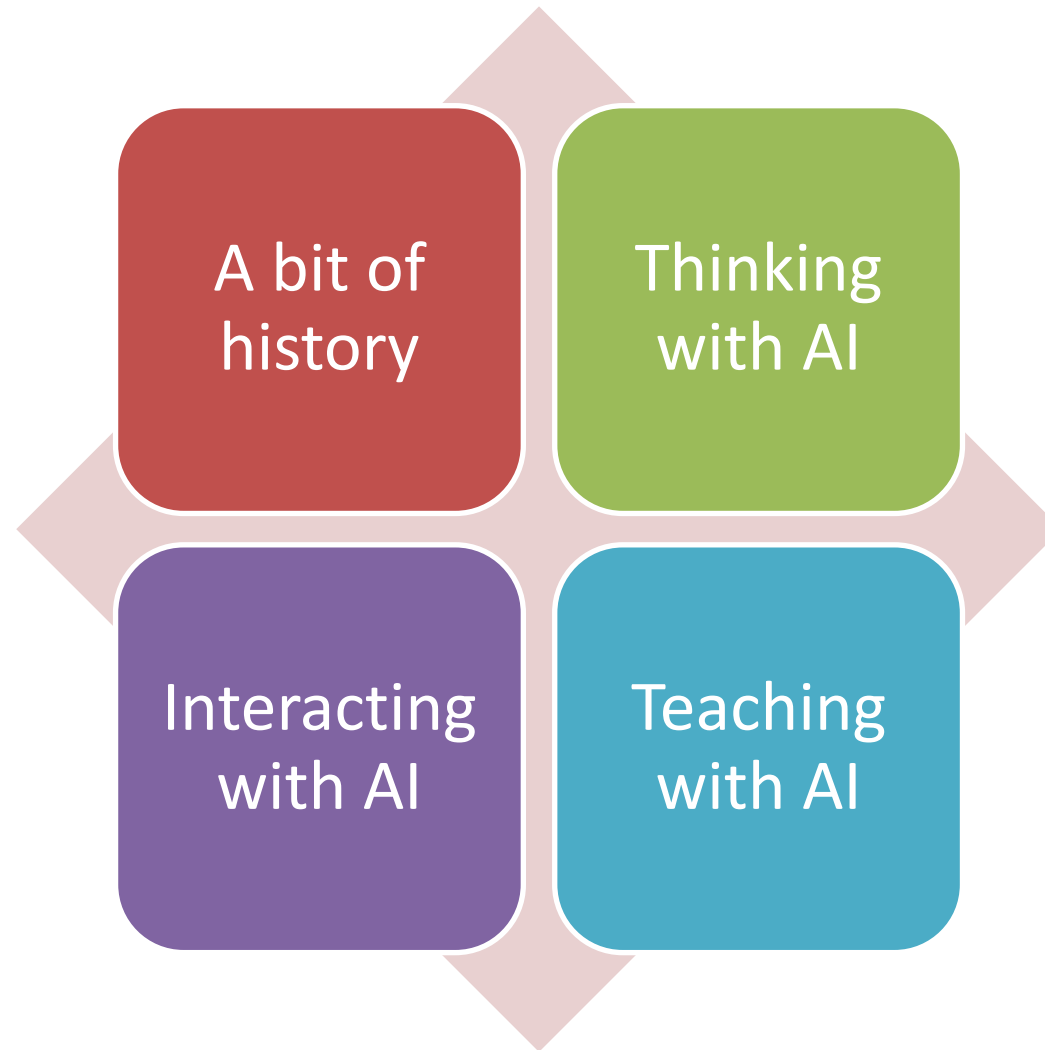
Actions are being taken to mitigate bias in artificial intelligence



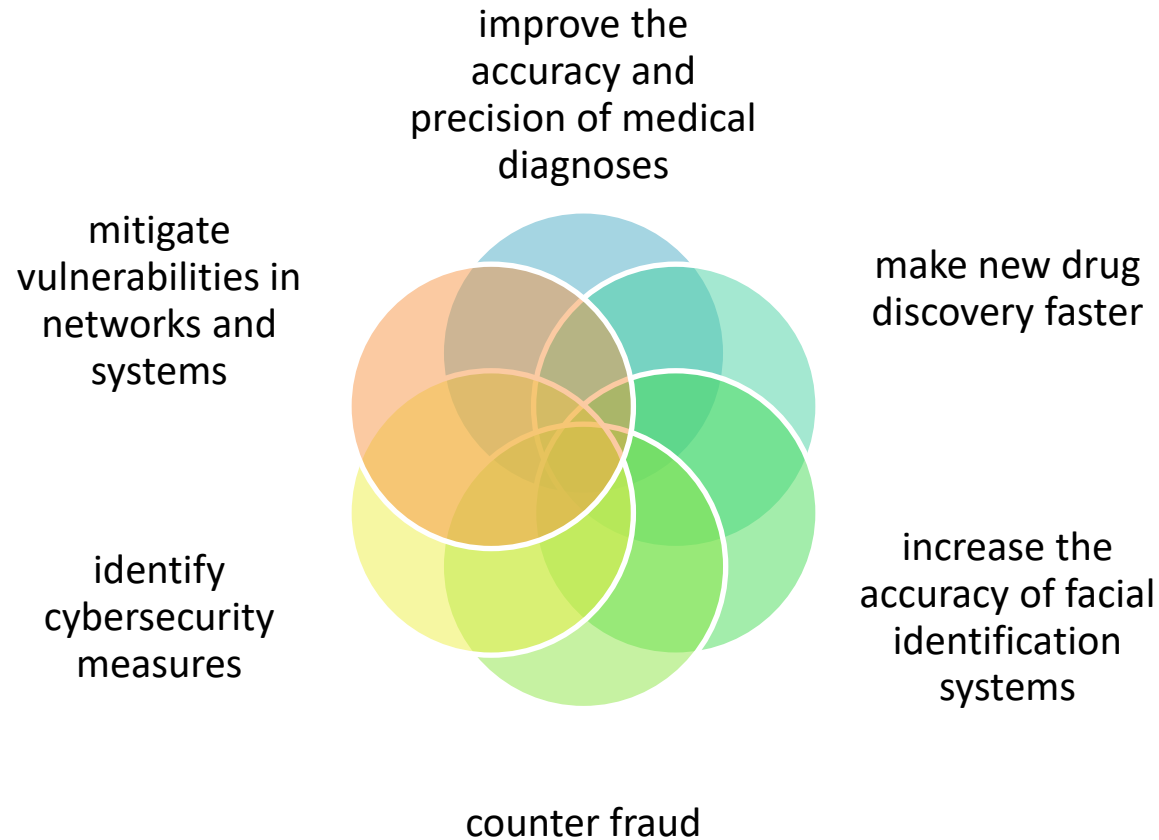
# General Rule



# Overview



# Artificial Intelligence



AI is one of the most important things humanity is working on

AI will have a deeper impact than electricity and fire

Sundar Pichai, CEO of Google and Alphabet

# Impact on work and society

Some jobs will be replaced by AI

All jobs will be impacted by AI

Generative AI will change the way people think, but not just at work

Education

Journalism

Professional Communication

Notariat

Justice

Computer Programming

...

# Impact on work and society

In each job there are many tasks that a human will need to do

Critical thinking will remain essential

Routine tasks will be delegated to AI, while most thinking and creating jobs/tasks will be carried out by humans

People might not want to produce more AI-assisted work, even if it is better and faster



# AI can do faster and better

AI can alphabetize,  
format, summarize,  
translate ... very  
quickly

AI can scan an image  
in more detail, even  
pixel by pixel

AI can process a large  
amount of data,  
without getting tired

AI can be as reliable as  
humans in many tasks

meeting notes, translations,  
finding cancer cells, finding  
legal precedents, ...

AI-assisted work may  
be faster, better,  
cheaper, and more  
enjoyable ...

However, professional  
work will still need  
human expertise

# Co-Intelligence

Co-intelligence combines human intelligence and AI capabilities to achieve superior results

Humans contribute creativity, empathy, and domain expertise

AI offers computing power, pattern recognition, and scalability

Emphasizes synergy, where **AI empowers rather than replaces humans**

# AI as a collaborator

**Improved decision making**  
through AI-assisted insights

## **Increased creativity**

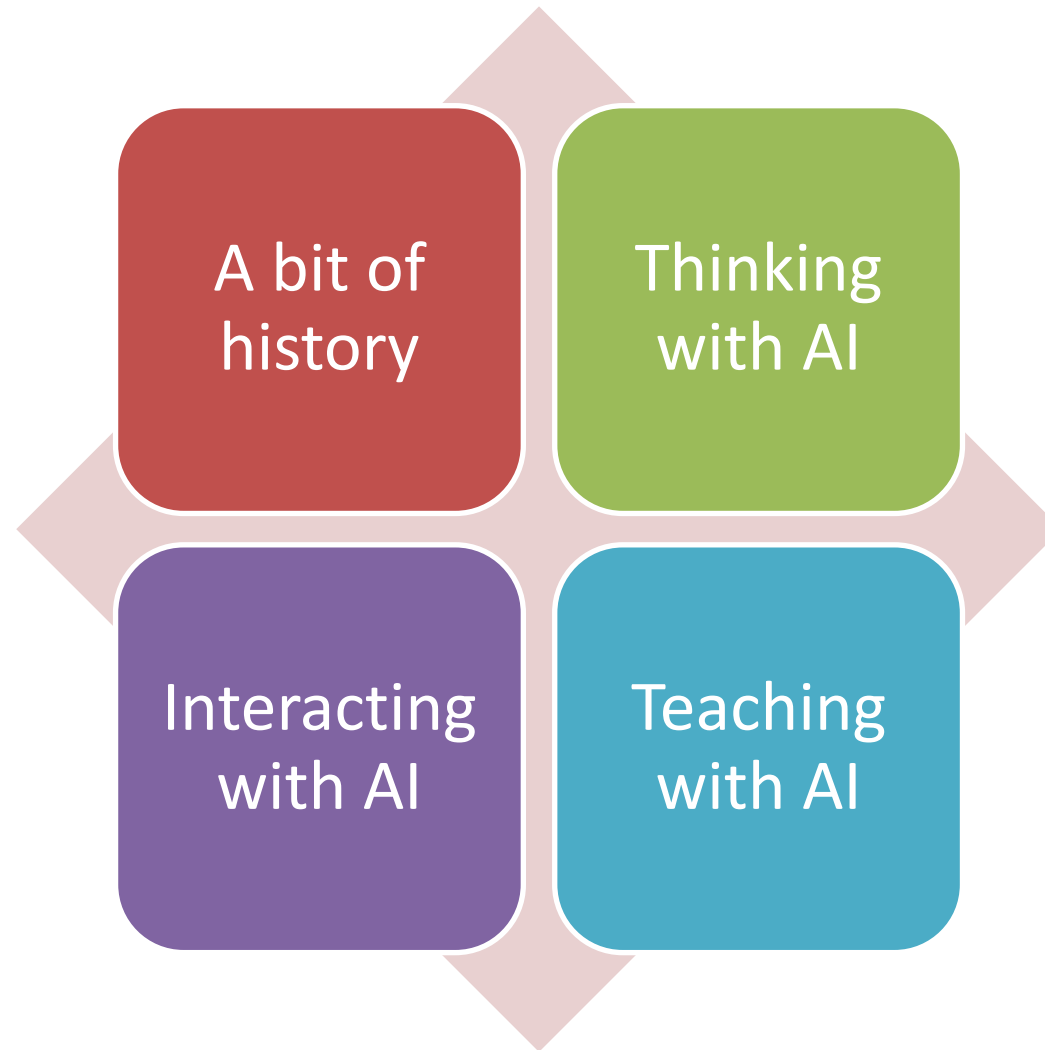
AI fosters brainstorming and  
content creation

**Improved problem solving** in  
complex fields  
e.g. healthcare, finance

## Real-world examples

- **Healthcare diagnostics:** AI suggests diagnoses, physicians validate
- **Product design:** AI generates prototypes, humans refine
- **Research:** AI analyzes data, researchers interpret results

# Overview



# ChatGPT

## What is ChatGPT



☐ Language model based on Transformer architecture (OpenAI)

☐ Trained on billions of textual tokens to generate natural language responses

## Main features



☐ Contextual understanding: consistently answers articulated questions

☐ Text generation: articles, emails, reports, communication proposals

☐ Tone customization: formal, informal, technical, creative

## Advantages over other tools



☐ Flexibility of use (interactive chat, API embeddable, ...)

☐ Continuous updates and improvements through user feedback

# ChatGPT Versions

Version	Release Data	Context Size	Main Features	Notes
GPT-3.5	March 2022	4096 tokens	Fine-tuned for conversations and instructions	Used in free ChatGPT
GPT-4	March 2023	8192 tokens	Advanced reasoning, multimodal capability. Excellent performance, but heavy and expensive.	Used in ChatGPT Plus
GPT-4 Turbo	November 2023	128k tokens	Faster and cheaper version of GPT-4	Used in ChatGPT Pro
o3	April 2024		Advanced reasoning	
o4mini	May 2024		Uses advanced reasoning and it's faster	
o4mini-high	May 2024		Great at coding and visual reasoning	
GPT-4.5	Research Preview		Good for writing and exploring ideas	

# Problem Formulation

Problem formulation involves clarifying and accurately framing the issue to be addressed

## Identification

Recognize and describe the main problem and its key elements

## Goal Setting

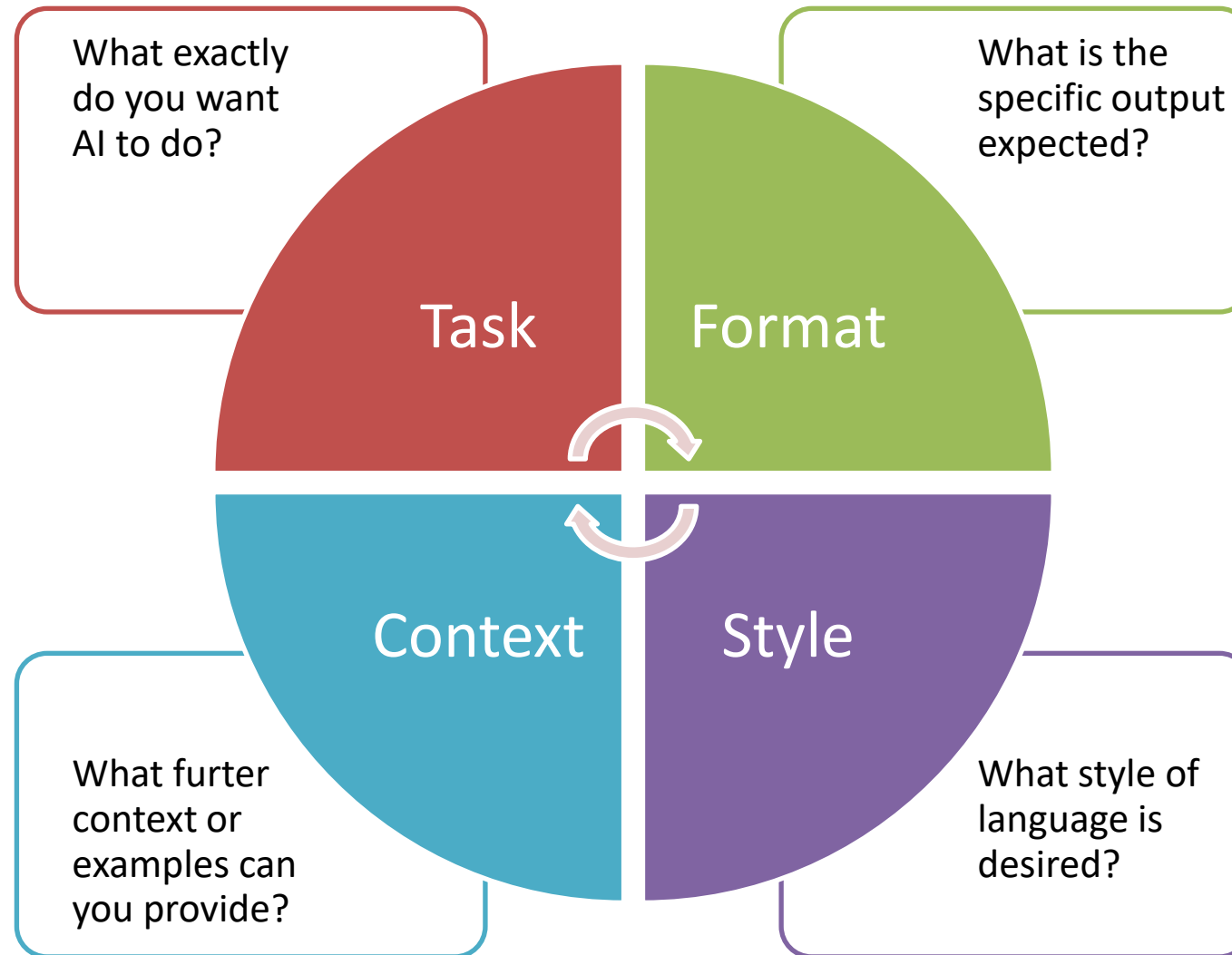
Establish desired outcomes and success criteria

## Context Analysis

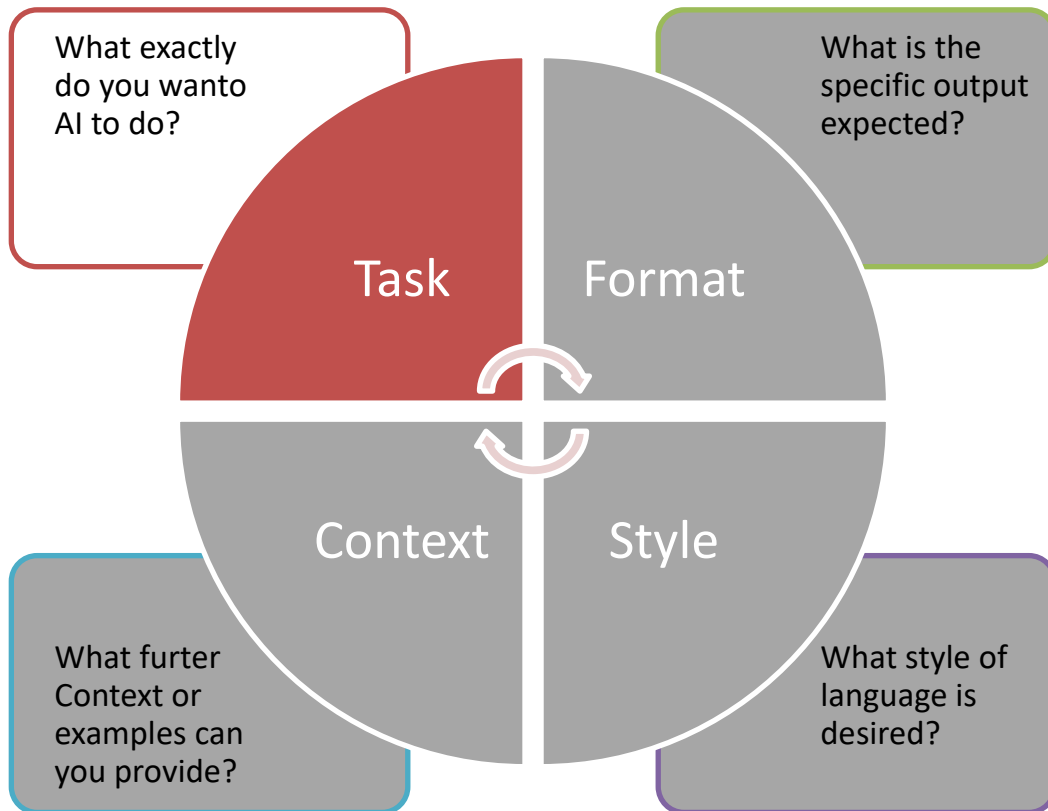
Assess the context in which the problem arises and gather relevant information



# Prompt Engineering

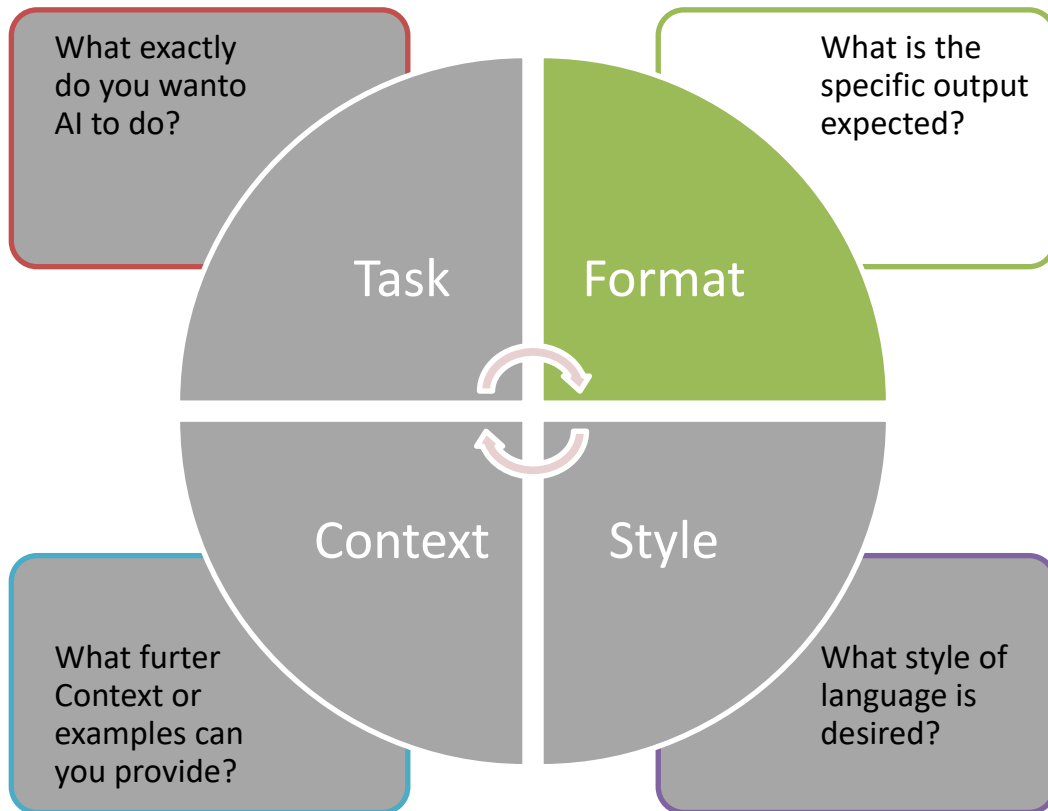


# Prompt Engineering



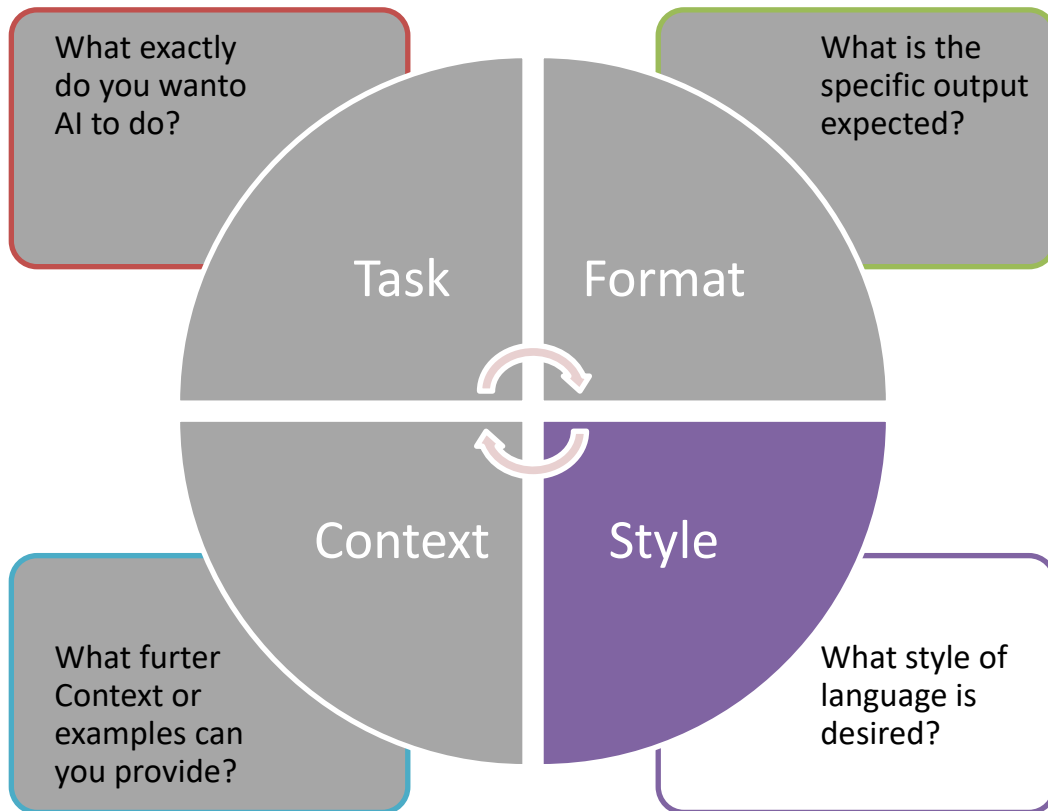
- Generate
- Write
- Summarize
- Rephrase
- Expand
- Analyze
- Elaborate
- Translate
- Transform
- Detect
- List
- Draw
- Invent
- ...

# Prompt Engineering



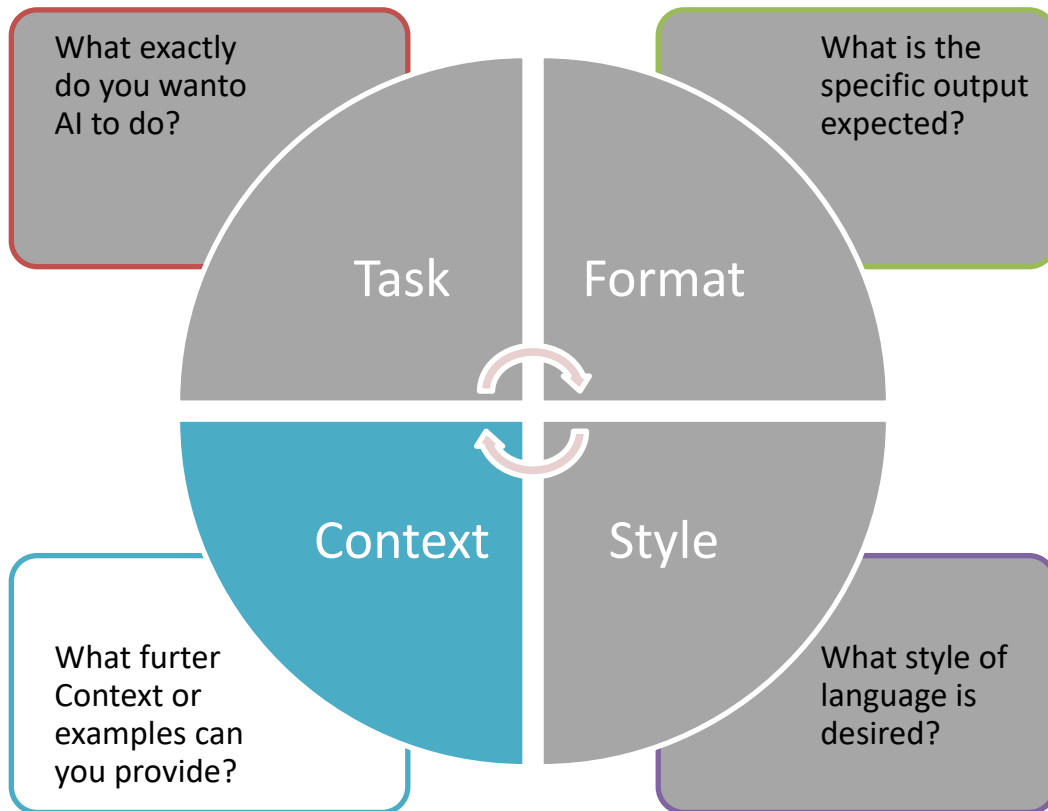
- E-mail
- Blog Post
- Notes
- Press Release
- List
- Table
- Graph
- Power Point presentation
- Spreadsheet
- Code
- Syllabus
- Lesson Plan
- ....

# Prompt Engineering



- Academic style
- Marketing style
- Comic style
- Archaic style
- Engineering language
- Medical language
- Law language
- Political language
- In the style of ...
- .. As you were ...

# Prompt Engineering



Follow this model

Use the attached file

Read the paper just uploaded

Suitable for an undergraduate class

For a presentation at a project meeting

PPT presentation at a course on radioprotection

...

# Some Examples

*Generate a list of 5-10 articles on Industrial IoT use cases to propose to graduate students in the computer engineering program*

*Produce 3 different way to introduce the use of AI in education to faculty members and researchers who are not computer scientists*

*Using the uploaded PDF file (scientific paper intended for a conference on Edge Computing), write a 200 abstract using the same style used in the uploaded paper*

*Create a press release about this recent cybersecurity attack at the University of X. Use the same format of previous University press releases (see the attached example). Emphasize that the attack was contrasted effectively and no data breach was observed*

# Suggestions for Effective Prompting

## No synonyms

- Avoid using synonyms to refer to the same thing

## Assertive style

- Using an explicit causal language can help

## No negative commands

- Negative or double-negative commands may be confusing
- Always convert into positive commands

## Models

- AI responds very well to models
- Use an existing model, whenever possible

## Constraints on length or structure

- “Maximum 150 words”
- “Write two paragraphs: one introductory and one concluding.”

## No ambiguity about secondary instructions

- If you ask to perform multiple operations, separate them clearly



# Iteration

Few complex task are accomplished with a single request

## → Iteration

- Reformulating the prompt
- Refining the search

### Reformulation

You can also ask ChatGPT to help in better formulating the prompt to achieve the desired result

### Refinement

Ask follow-up questions to clarify or elaborate  
“Can you detail step 3 for me with a practical example?”

# Human and AI Creativity

*The best way to  
have a good idea  
is to have lots of  
ideas*

Linus Pauling



Humans and AI  
generate new  
ideas by trying  
new combinations

- AI can do this at greater speed and quantity
- AI ability to hallucinate is a form of creativity

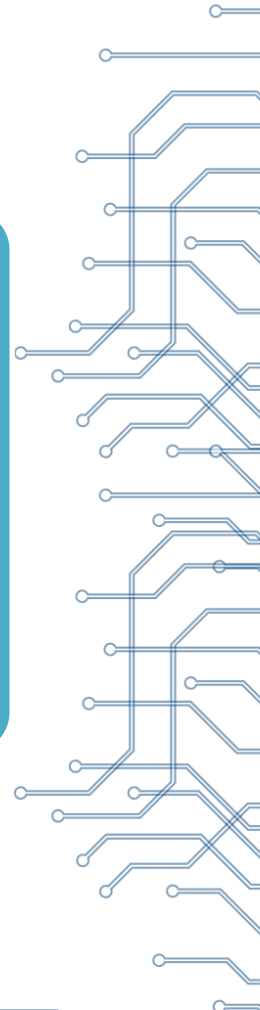


AI can help  
humans in

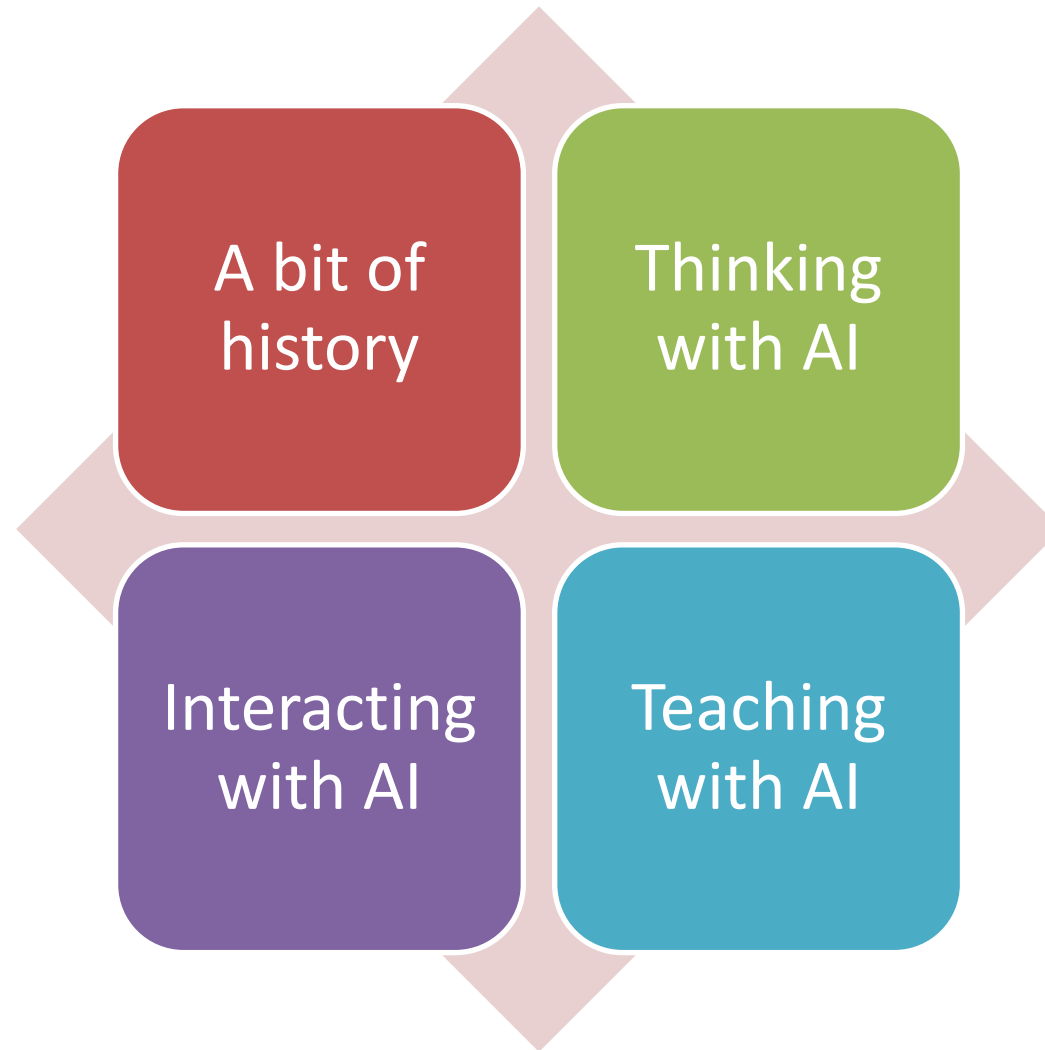
- Explore new ideas
- Clarify their thoughts
- Increase divergent thinking
- Become more creative



**We should help  
students to be  
better thinker  
with AI**



# Overview



# Tasks of Faculty Members

Research

Teaching

Management

Bureaucracy

...

The rise of computers and the Internet has fundamentally reshaped our way of working

AI is expected to drive an even more profound transformation in how faculty conduct their teaching and research

# Copilot



## Compose and optimize e-mails

- Draft emails and suggest edits for clarity and professionalism
- Generate quick response templates based on context

## Create and edit documents

- Produce drafts of reports, letters, and PowerPoint presentations
- Recommend layouts, formatting, and consistent styles
- Summarize long sections or extract key points

## Rapid Research and Information Summarization

- Extract relevant data from web pages, documents, or emails
- Summarize scientific articles, business reports, or industry news
- Explain technical concepts or specialized terminology

# Copilot



## Analyze and Visualize Data in Excel

- Generate advanced formulas
- Create charts and interactive dashboards from raw data
- Identify anomalies, trends, and insights through guided analysis

## Generate Presentation and Briefing Content

- Create slides with titles, key points, and suggested graphics
- Produce speaker notes consistent with slide content
- Translate text between languages and adjust tone as needed

# Research Assistant

Deep literature review

Discover emerging topics

Summarize key findings and methods from multiple PDFs



SCISPACE

## The Fastest Research Platform Ever

All-in-one AI tools for students and researchers.

Designing an Efficient Cloud-to-Things Continuum for Real-Time Mobile Applications

Standard

High Quality

Deep Review





# Research Assistant

247 papers found



[1] Real-Time Edge Computing Services for Internet of Things-based Cloud Networks

Manish Srivastava + 2 more

[2] Efficient Cloud-Based Real-Time Geo-Information Delivery for Mobile Users

Guang Jin + 5 more - Mobile Data Management

[3] 5G and IoT Cloud Integration for Enhancing Connectivity and Data Management

Abhigna Manikanta Paladugu + 8 more

[4] Stratus: Energy-Efficient Mobile Communication Using Cloud Support.

Bhavish Aggarwal + 8 more

[5] Using the MQTT protocol in real time for synchronizing IoT device state.

Adnan Shaout + 1 more - The International Arab Journal of Information Technology

[6] On Energy-Efficient Offloading in Mobile Cloud for Real-Time Video Applications

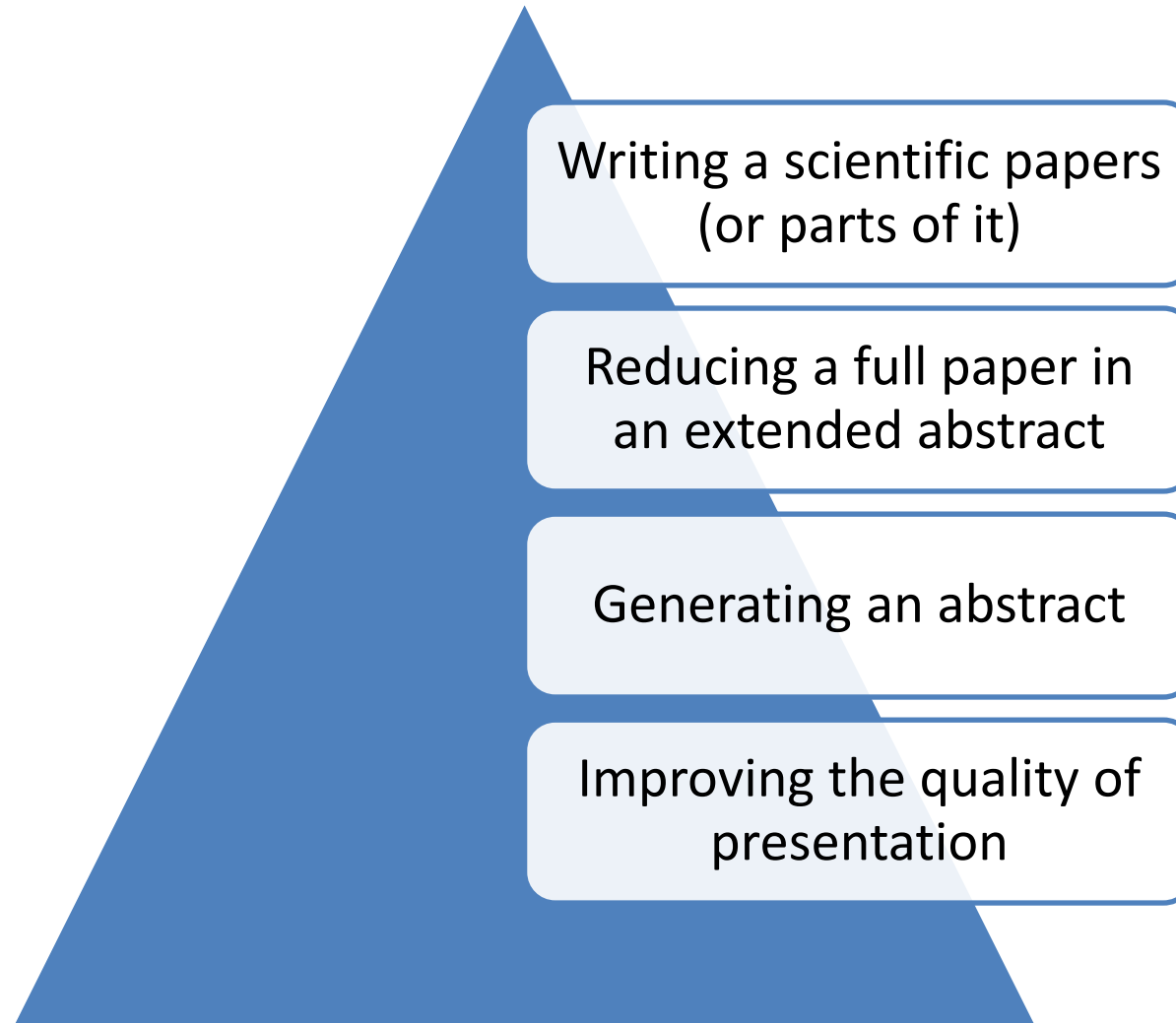
Lei Zhang + 4 more - IEEE Transactions on Circuits and Systems for Video Technology

[7] A Survey and Design of a Scalable Mobile Edge Cloud Platform for the Smart IoT Devices and



SCISPACE

# Research Assistant



# Research Assistant



*Suggest five different approaches to structuring these concepts in a manuscript*

*Compose a concise abstract for the attached paper (200 words)*

*Recommend a different, more appealing, title for this article*

*Draft an opening paragraph that reviews the existing literature on my topic, including appropriate citations*

*In what alternative ways could I deepen the concept introduced in paragraph X?*

# Research Assistant



*Which additional studies or sources could I include to reinforce this thesis?*

*Convert my research summary into a funding request for foundation Y, following their goals and criteria*

*Prepare a progress report for my grant X using the foundation's official template*

*Who are the leading figures in this field who might review this paper? Which of their publications should I cite?*

*Organize these research findings into a 6,000-word paper suitable for submission to journal X*

# AI-supported Writing

Scientific papers  
from results

Project reports

Books

Reduced version of a  
paper/report/book

- extended abstract from a  
previous longer paper

Notes from  
brainstorming

Thesis (students)

...

# AI-supported Writing

operating modes of a user. We assumed that the notebook can be (i) *handheld* by the user, at a distance of approximately 1 m from the TR; (ii) *on the desk*, at a rough distance of 1.5 m from the TR; (iii) *on the floor*, at a distance of 2.5 m from the TR.

Fig. 2 shows the upstream and downstream bit rate experienced by the user when the EP moves along the  $x$  axis (the trend is similar for the  $z$  axis). The bit rate is strongly dependent on the vertical distance between EP and TR. When the shift on the  $x$  axis is limited, the bit rate increases with the EP closer to the transceiver due to the higher power of the incoming signal. We observe that, at the distances considered, the maximum bit rate is in the range [170–250] Mbps and [110–160] Mbps for downlink and uplink flows, respectively. When the shift on the  $x$  axis increases, the behavior drastically changes and higher rates are experienced at larger vertical distances. This is because the radius of the light cone emitted by the photodiode on the transceiver increases with the vertical distance (see Figure 1). Consequently, the maximum distance at which it is possible to transmit/receive data, increases with the vertical distance. In our setup, when the notebook (EP) is held in hand by the user (vertical distance of approximately 1.0 m), the maximum transmission distance is about 1.1 m. The same increases to approximately 1.7 m, when the notebook is located on the floor (distance equal to 2.5 m).

As a final remark, we can observe that even when the EP is

## III. CONCLUSIONS

We can draw some important lessons from our experimental measurements. The cone of light emitted by each transceiver is limited to a few meters; therefore, many transceivers are required to cover a certain area. Each TR location must be selected carefully to avoid shadow areas. The maximum bit rate is in the order of hundreds of Mbps, higher than that provided by Wi-Fi. However, it decreases significantly with distance from the TR, especially if line-of-sight is not guaranteed. Obstacles can partially or completely obstruct the light signal, making communication impossible in certain areas. In conclusion, this technology has a number of interesting properties that make it appealing in specific contexts. Conversely, it may not be suitable for scenarios where uninterrupted service is essential.

## IV. CREDITS

Some content presented in this paper was generated through Artificial Intelligence. The authors have verified sources and correctness.

## REFERENCES

- [1] *IEEE Standard for Information Technology, Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications - Amendment 6: Light Communications*, IEEE Computer Society Std., June 2023, IEEE 802.11bb-2023.

# AI-supported Assessment

Generate 5 questions about topics described in the following syllabus but limited to only classes taught by Giuseppe Anastasi: <link>

## Cyber-Physical Systems vs. Internet of Things

Explain the main differences between a cyber-physical system and an IoT network, including in your comparison the concept of a Digital Twin and the layered structure of the IoT protocol stack.

## Sensors and Tags in Pervasive IoT

What are the characteristics and advantages of “passive,” “semi-passive,” and “active” sensors in a pervasive IoT environment? Also describe how RFID tags differ from “beacon” tags in data collection.

## Energy-Saving Strategies in IoT

Describe the main energy management techniques in a Low-Power and Lossy Network (LLN)

## MAC Protocols for IEEE 802.15.4

Illustrate how the main channel access mechanisms work in IEEE 802.15.4 (BE vs. NBE modes, slotted CSMA/CA)

## Architecture and Scheduling in 6TiSCH

Analyze the 6TiSCH architecture, explaining the role of the 6top layer and the difference between centralized scheduling (e.g., AMUS) and distributed scheduling . What are the advantages and limitations of each approach in terms of scalability and reliability?

# AI-supported Assessment

Create 5 multiple-choice questions on the syllabus at the following link. Each question should include one correct answer and 3 additional plausible, but incorrect, answers. Do not include a “none of the above” or “all of the above” option

Thought for  
36 seconds

**What is the primary purpose of a Digital Twin in a Cyber-Physical System (CPS) ?**

- 1.A digital replica of a physical system used for simulation and monitoring.
- 2.A sensor node hardware platform optimized for LLNs.
- 3.A duty-cycling technique for power management in LLNs.
- 4.A protocol for header compression in 6LoWPAN.

**In Sensor Networks what is the main function of the GAF (Geographic Adaptive Fidelity) algorithm?**

- 1.Conserving energy by turning off redundant nodes based on their location within a virtual grid.
- 2.Placing nodes in low-power listening (LPL) mode to minimize active periods.
- 3.Using model-based prediction to adjust each node's sampling rate dynamically.
- 4.Assigning time slots in a decentralized fashion as part of 6TiSCH scheduling.

**Which of the following best describes the main limitation of IEEE 802.15.4 CSMA/CA in Industrial IoT (IIoT) applications?**

- 1.Unpredictable latency due to contention-based channel access.
- 2.Inability to compress IPv6 headers efficiently.
- 3.Lack of support for integrating Digital Twins.
- 4.Excessive energy consumption caused by continuous beacon transmissions.

**In the context of power management in LLNs, what is the key difference between a “wakeup radio” and a “scheduled rendezvous” scheme?**

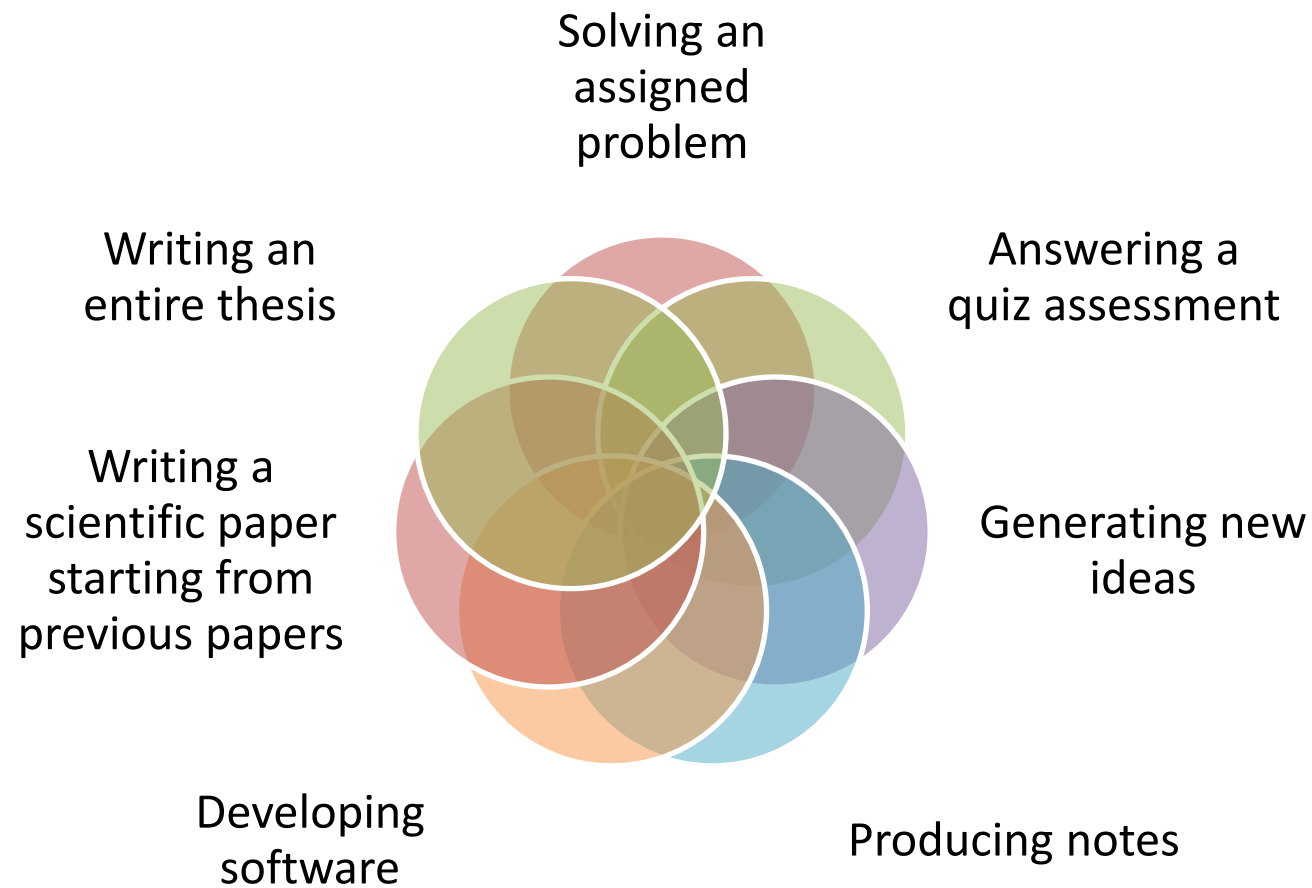
- 1.A wakeup radio uses a secondary ultra-low-power receiver to wake the main radio on demand, while scheduled rendezvous synchronize active periods among nodes.
- 2.A wakeup radio compresses packet headers, whereas scheduled rendezvous compresses payload data.
- 3.A wakeup radio refers to sensor nodes harvesting ambient energy, while scheduled rendezvous relies solely on battery power.
- 4.A wakeup radio schedules network topology changes, and scheduled rendezvous handles routing table updates.

**What is the role of the 6top sublayer in the 6TiSCH architecture?**

1. It manages the scheduling of cells between neighbors, interfacing the TSCH MAC layer with upper layers.
- 2.It implements duty-cycling and energy harvesting strategies for sensor nodes.
3. It defines the IPv6 addressing and neighbor discovery protocol for LLNs.
- 4.It provides data compression and decompression using CBOR and EXI.



# Cheating by Students



# Project Assignment

**Implement the Trivia Quiz Multiplayer game using a client-server application**

The game involves questions and answers. The server asks questions to all connected clients. Players submit their answers to the server, which grades them and updates the score, maintaining a ranking of all players.

There must be at least two themes for questions

Technology

General Culture

There must be 5 questions per theme

(1) Who founded the company Microsoft? Answer: Bill Gates and Paul Allen;

(1) Which company introduced the first commercial personal computer in 1981? Answer: IBM;

(2) Which ocean is the largest in the world? Answer: Pacific Ocean

(2) What is the longest river in the world? Answer: Nile

Client must decide which quiz they want to participate in (they can only participate in one quiz at time), and each theme will have its own ranking.

1 point for correct answer

0 points for wrong answer

You can participate only once in each individual quiz.

For implementation, choose the communication protocols, packet structures, the data exchange modes (text or binary), and the type of server (iterative, concurrent, or based on I/O multiplexing) depending on aspects that are deemed congruous to the application described. The considerations made in making all these decisions should be explained in a documentation to be delivered along with the sources.

# Prompt for generating the code



**Specifications**

3 pages

*Generates the code that implements the application described in the attached PDF document according to the specifications described in the same attached PDF document*

Below you will find two complete C files (server.c and client.c) that implement the “Trivia Quiz Multiplayer” application described in the attached PDF specification.

The server uses I/O multiplexing with select() to handle multiple clients simultaneously, keeps in memory two quizzes of 5 questions each (reads from file), handles unique nicks, ranking by theme, special commands, and disconnects.

The client connects to the server, chooses the quiz, submits answers, can request ranking with show score or end the quiz with endquiz.

Both files are commented line by line to explain variables, data structures, and logical flow.

# Output from ChatGPT



**server.c** (595 lines of code)

Explanation of the most important parts of **server.c**

**client.c** (330 lines of code)

Explanation of the most important parts of **client.c**

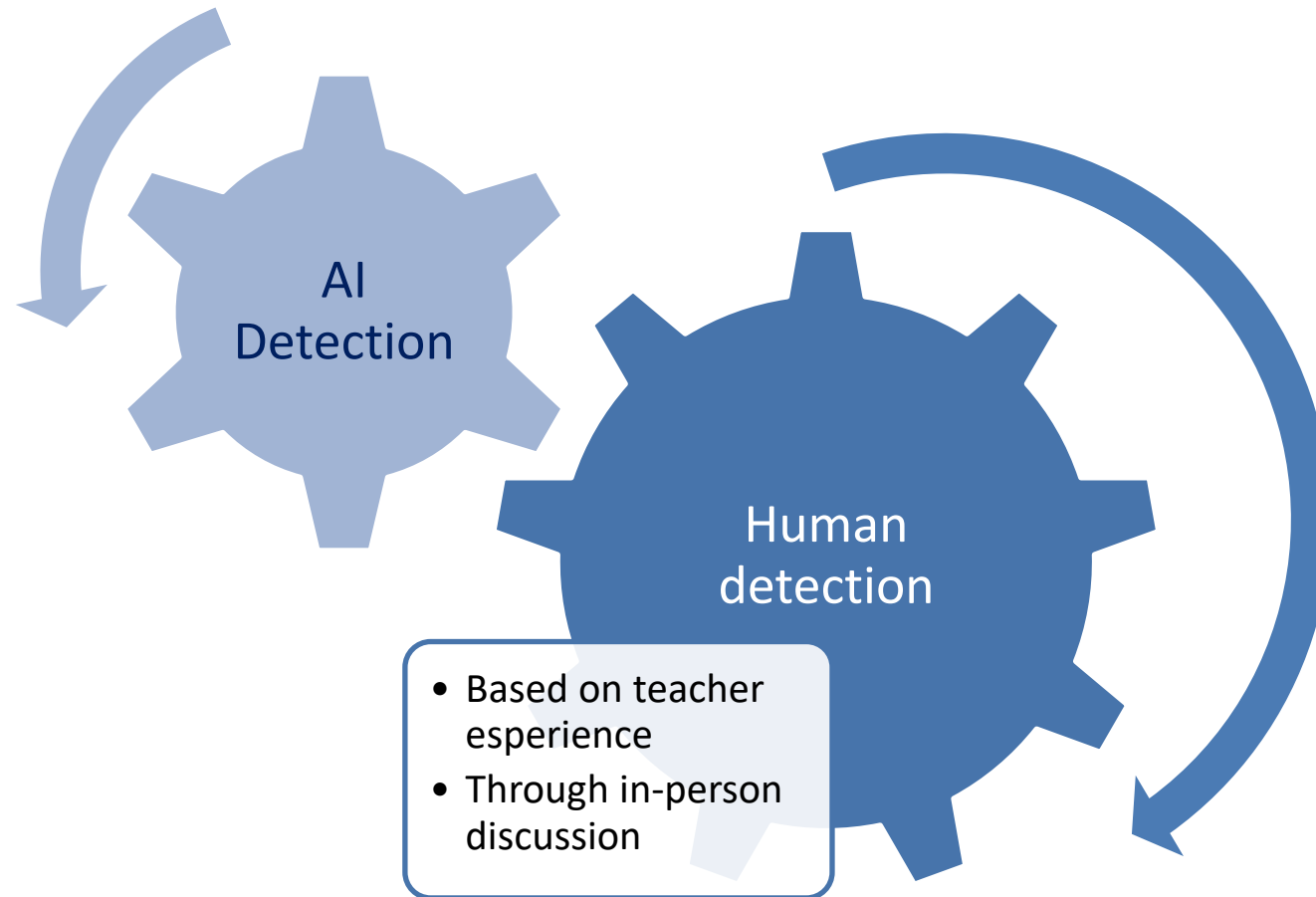
Sample files for testing the application

Commands to compile and execute the application

Does it work?

Grade: 1/5 (E)

# Cheating Detection



# Personalized Assistants

## Student Interaction

- Weekly meetings with PhD students

## Course Assistant

- Answers questions on a specific course

## General Assistant

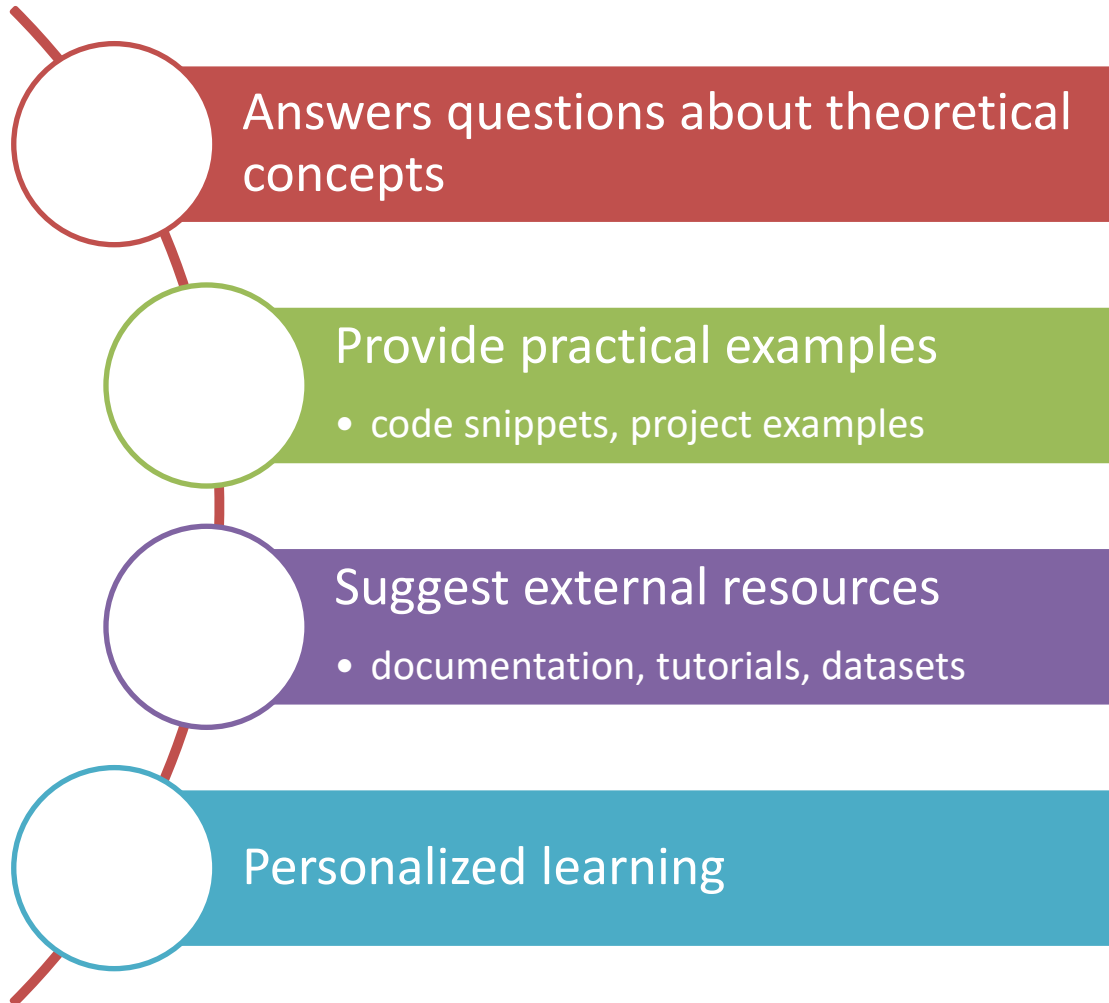
- Provides information about specific aspects
- In many languages

...


# PERSONALIZED GPT



# Course Assistant



... ×



**ICT Infrastructures course assistant**

By ANTONIO CISTERNINO 👤

Assistant on ICT infrastructures course at University of Pisa

**15**  
Conversations

**Capabilities**

- ✓ Web Search

Start Chat

# General Assistant



Sibylla is an open source AI chat system developed by the University of Pisa

It provides timely information about the regulations and operation of the university

Questions can be asked in any language

Sybilla is based on ChatGPT and the Oraculum system

Source codes are available to the community on GitHub



# Sibylla



devo andare in missione ma mi sono ammalato.  
Posso chiedere il rimborso di tutte le spese  
fatte



La malattia, documentata da certificato medico, potrebbe legittimare il rimborso delle spese sostenute e non rimborsabili dai fornitori di servizi solo con riferimento a missioni già autorizzate. Tuttavia, è importante notare che è necessario che la missione sia stata autorizzata preventivamente per poter richiedere il rimborso delle spese.

我必須去執行任務，但我生病了。我可以要求報  
銷所有產生的費用。



根据规定，如果您因病无法执行任务，只有在已经获得授权的情况下，才能报销已产生的费用。此外，您还需要尝试联系酒店和交通公司，以尝试追回已经支出的费用。无法追回的费用将会被报销。

# Need for Human Supervision



## Key risks

- Possibility of unverified or inaccurate content
- Dependence on automated solutions



## Guidelines for responsible use

- Always verify sources
- Transparency to the public on the use of AI
- Protection of sensitive data



## Human-machine balancing

- AI as an intelligent assistant, not a substitute
- Training users on the limitations of AI tools



# Future Perspectives

## Evolving trends

- Conversational AI in augmented/immersive reality apps
- Multimodal systems for rich content
- Specialized models for vertical applications

## What is changing for users?

- Advanced digital skills (prompt engineering, AI ethics)
- Collaboration with IT/Data Science teams

## Take-away

- AI does not replace human creativity and thinking
- Powerful tool for speed and personalization
- Conscious adoption is competitive advantage

AI agents

# AI Agent

AI system designed to act as an autonomous agent, able to set goals, make decisions, and act proactively without step-by-step instructions

## Autonomy

Operates independently for long periods of

## Goal-oriented

Plans and acts to achieve complex goals

## Proactive behavior

Takes initiative when appropriate

## Memory and learning

Adapts based on context and past

## Persistent context

Handles long-term tasks or conversations

# AI Agents vs. Chatbots

## Chatbot

Reactive Behavior

One-step commands

Limited context

No long-term planning

## AI Agent

Proactive behavior

Multi-step reasoning

Maintains context over time

Able to initiate and complete complex tasks

## Examples

Intelligent personal assistants (organizing a trip)

Autonomous research agents (research plan on a certain topic)

AI software developers (developing a program)

# AI Agents for Teaching/Learning

## Assessment Agent

- Generates diverse, objective-aligned question pools

## Automated Feedback & Grading

- Instant scoring of quizzes, essays or code with detailed improvement tips

## Virtual Lab Simulations

- Safe, guided experiments (e.g. circuits, data workflows) with real-time hints

## 24/7 Q&A Chatbot

- On-demand clarifications, analogies and references about course material

# AI Agents for Teaching/Learning

## Personalized Tutoring

- Tailors explanations, exercises & study plans to each student's needs

## Adaptive Learning Paths

- Dynamically adjusts content sequence, pace & difficulty based on progress

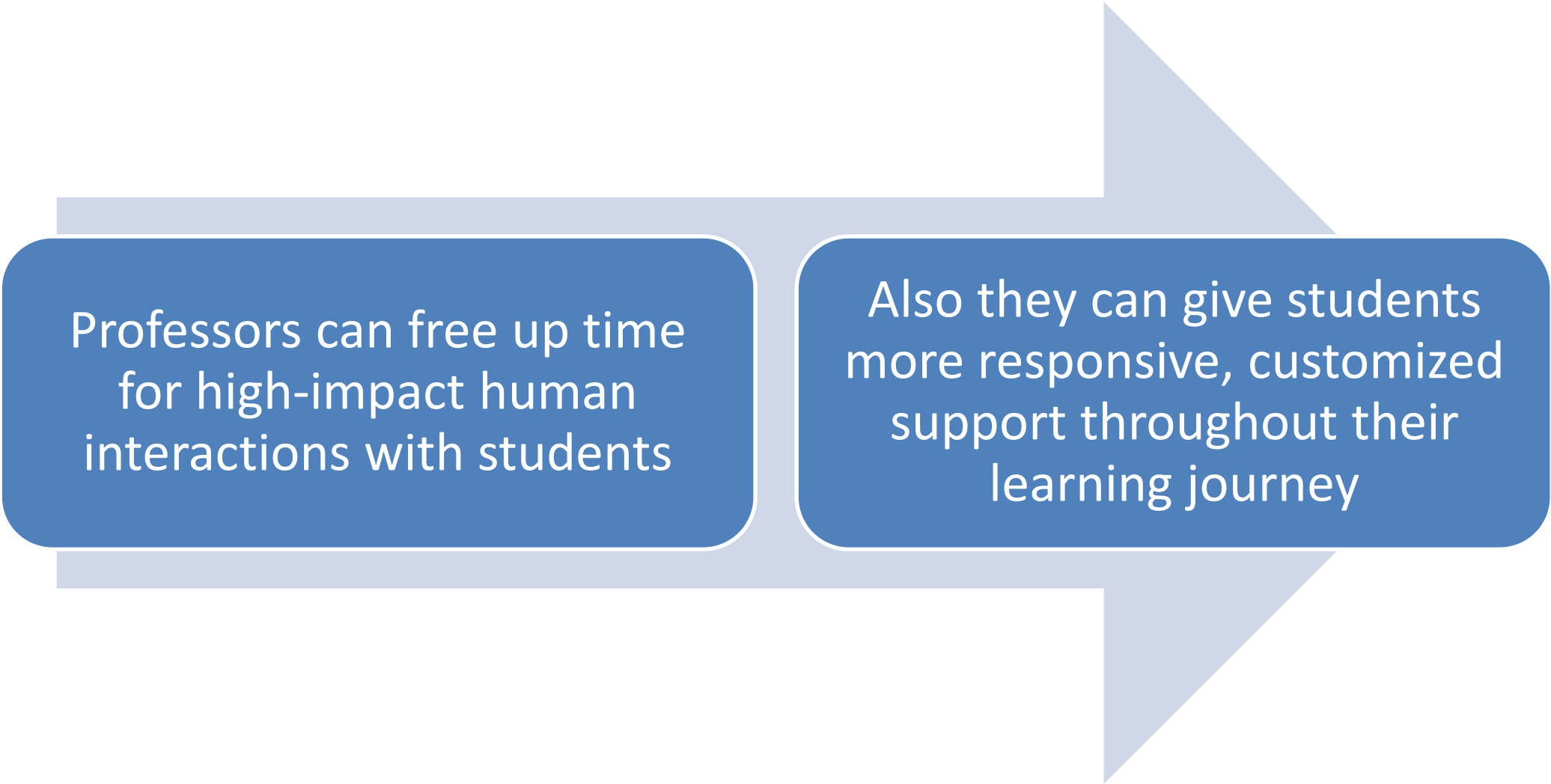
## Content Generation & Summaries

- Auto-drafts lecture outlines, examples or concise overviews of long texts

## Motivation & Study-Habit Coach

- Sends reminders, tracks streaks, celebrates milestones & combats procrastination.

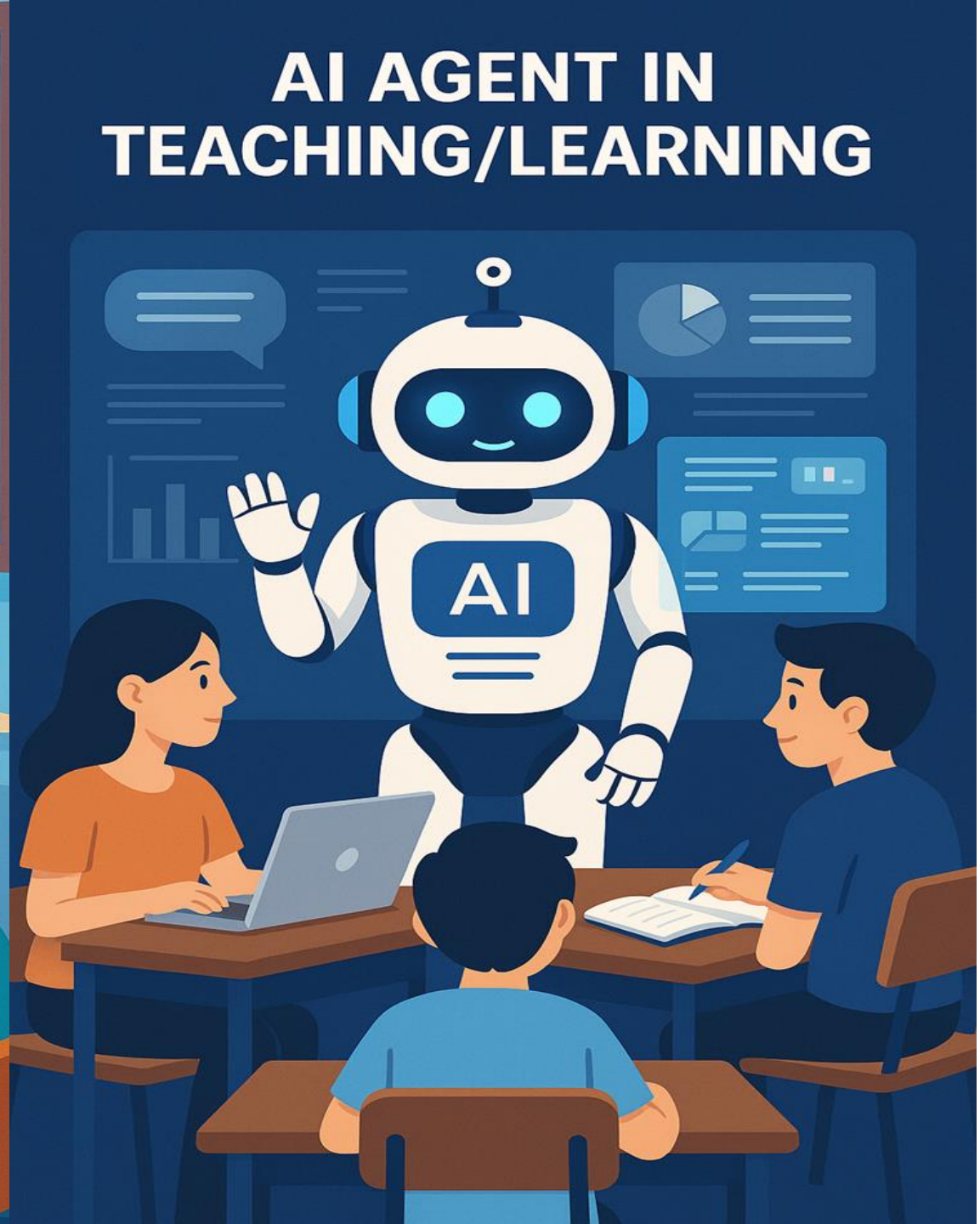
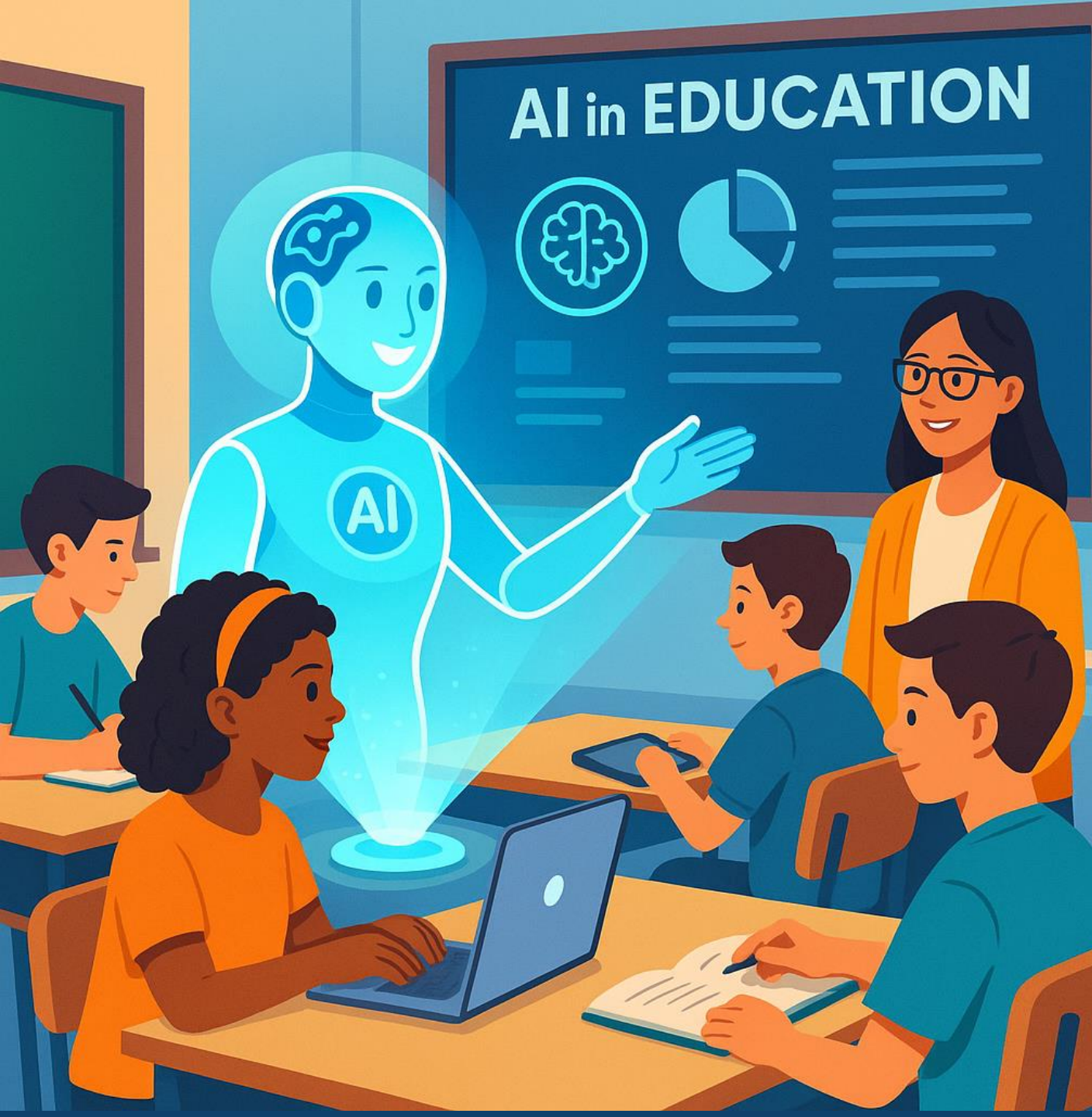
# Conclusions



Professors can free up time  
for high-impact human  
interactions with students

Also they can give students  
more responsive, customized  
support throughout their  
learning journey





# Teaching with AI



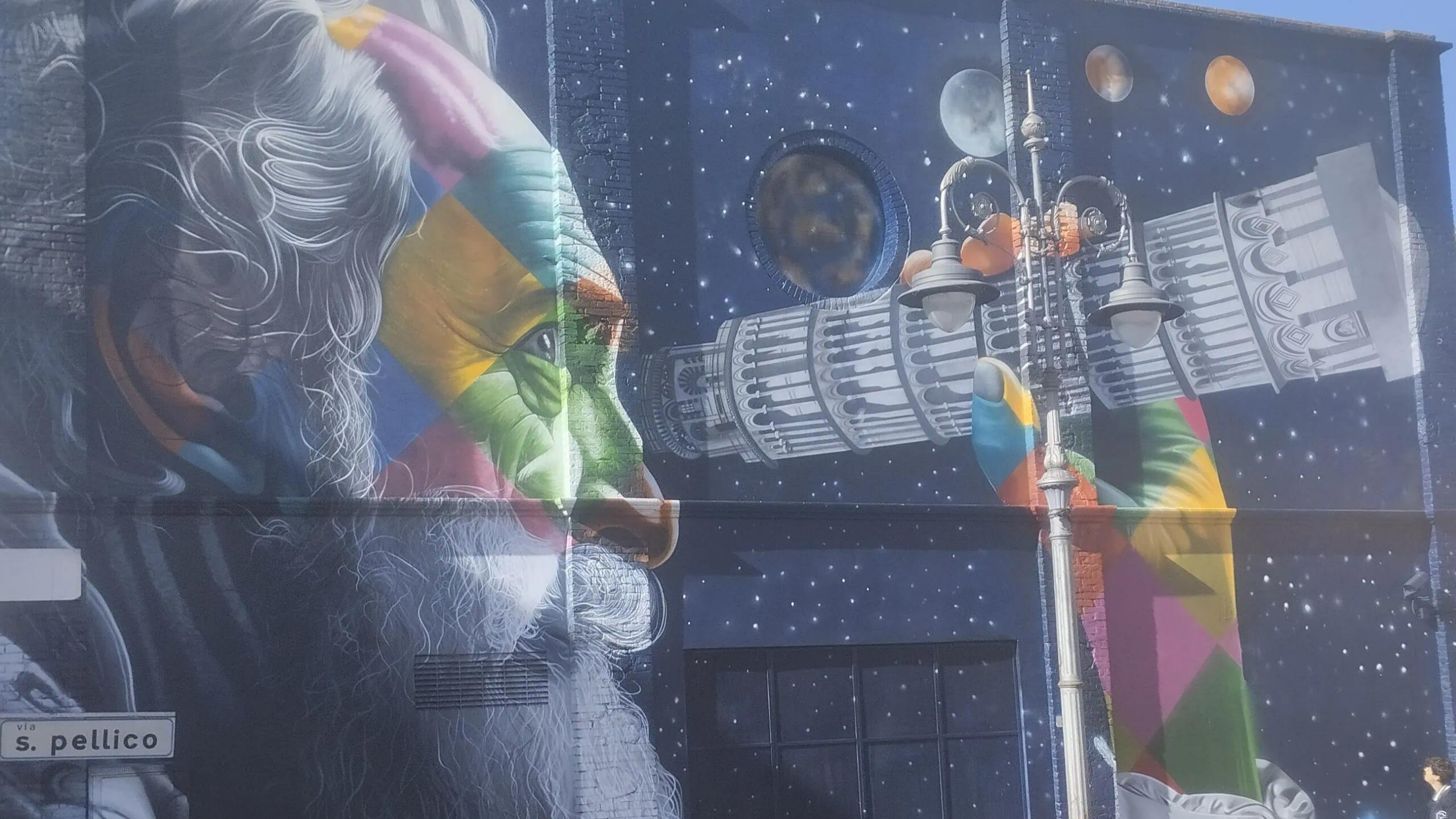
A PRACTICAL GUIDE TO A  
NEW ERA OF HUMAN LEARNING

José Antonio Bowen and  
C. Edward Watson

Much of the  
content  
presented was  
generated  
through  
Artificial  
Intelligence

The author  
has checked  
sources and  
verified  
content





via  
s. pellico



# Prof. Giuseppe Anastasi

<https://www.linkedin.com/in/giuseppe-anastasi-5660b37/>

## Background

Professor of Computer Engineering, teaches courses in *Computer Networks* and *Internet of Things*

He received his Ph.D. in Information Technology from the University of Pisa

He graduated (with honors) in Electronic Engineering from the University of Pisa

## Areas of Interest

Internet of Things

Fog/Edge Computing

Cyber-Physical Systems

Cybersecurity

Smart Environments (Cities/Industry/Energy, ...)

IT for Sustainability

IT & Society

## Relevant Experiences

### Rector's Delegate for Digital Transition, University of Pisa [2022 - Today]

### Director Emeritus, CrossLab for Digital Transformation, University of Pisa [2024 - Today]

- The CrossLab for Industry 4.0 is an initiative funded by the Ministry of University and Research under the *Departments of Excellence* program
- It consists of five interdisciplinary and integrated labs to support the digital transformation of companies and society

### Director, Department of Information Engineering, University of Pisa [2016 - 2020]

- The Department of Information Engineering at the University of Pisa is a Center of Excellence for Research and Higher Education in Information Technology (IT), Robotics and Bioengineering
- In 2018 and 2023, it was selected by the Ministry of University and Research as a *Department of Excellence*

### Director, National Lab on *Smart Cities & Communities*, CINI [2015 - 2018].

- The CINI (National Interuniversity Consortium for Informatics) Smart Cities & Communities National Laboratory is a national center of expertise for the digitization of Cities and Public Administration