

AI Applications for Learning

**2024 ICP WORLD
CONVENTION**
MOMBASA, KENYA

Council / **Convention**
August 16 - 18, 2024 / August 19 - 23, 2024



AI Applications for Learning

Our roadmap for the day.

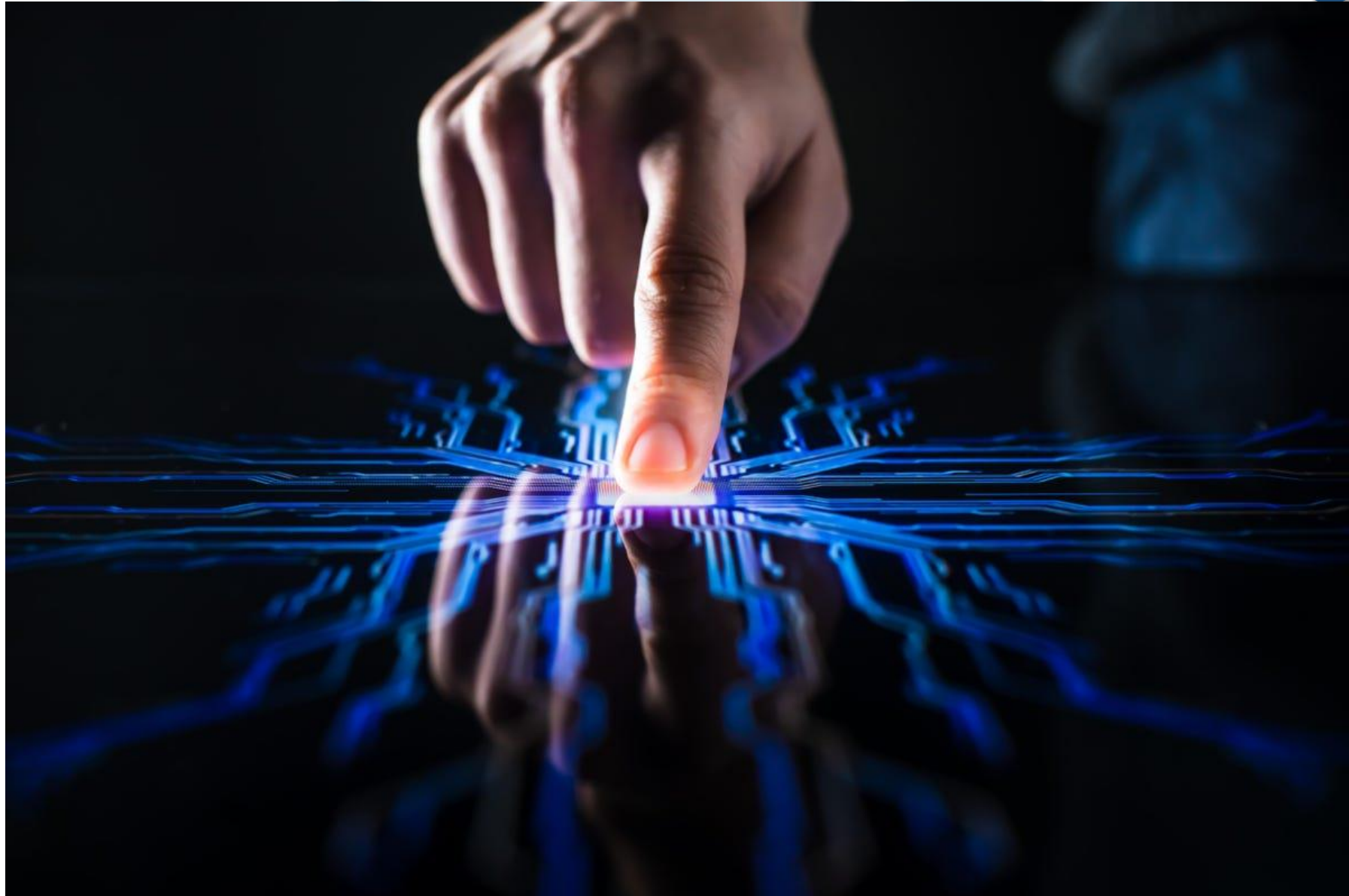
- Overview – GenAI basics, implications.
- General Purpose Applications.
- Applications for Reading and Writing.
- Subject-specific applications.
- GPT-o, advanced applications.

AI Applications for Learning

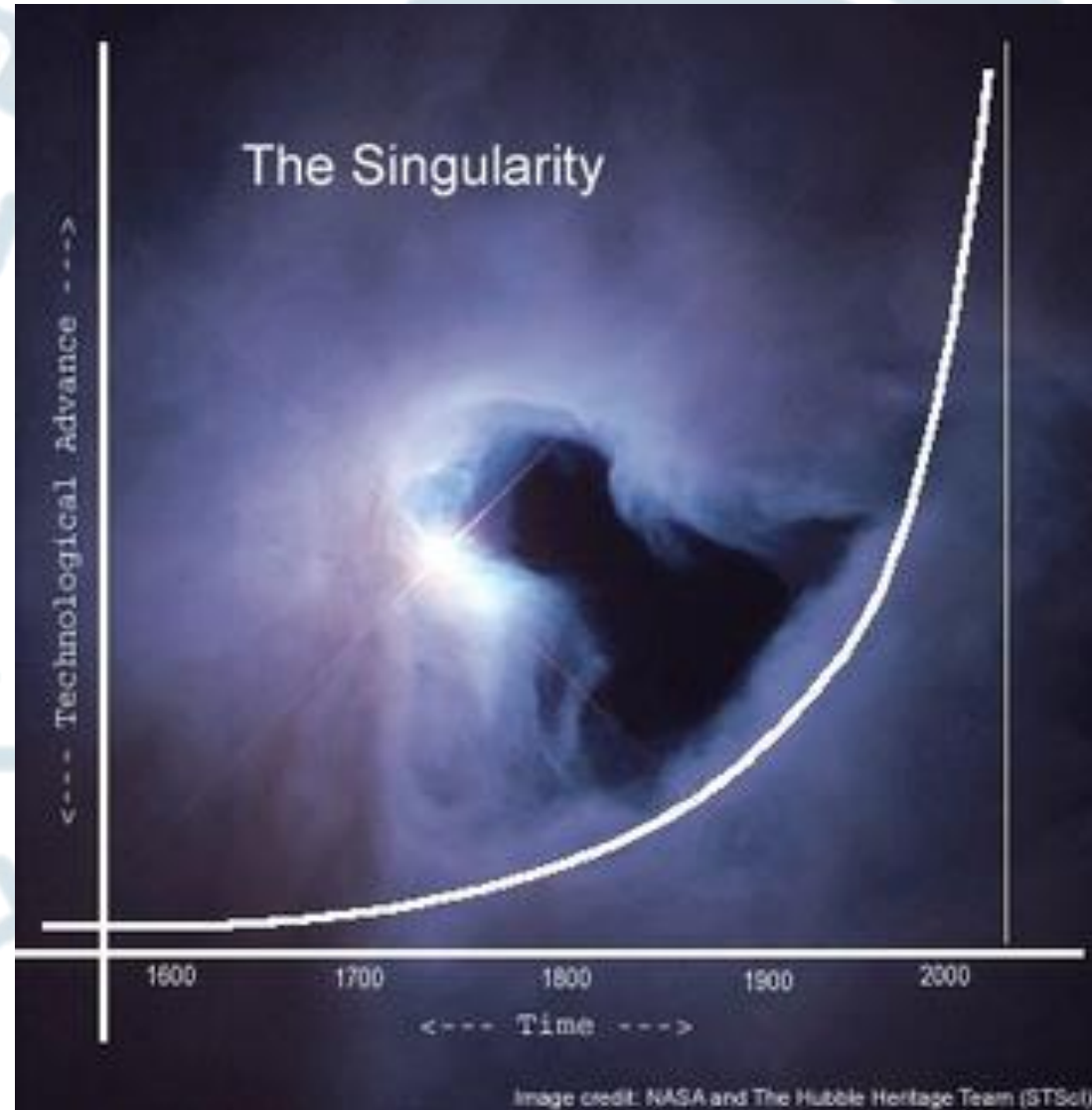
Our roadmap for the day.

- **School processes.**
- **Custom GPTs.**
- **Applications for the leadership role.**
- **Ethical and social implications.**
- **Schools redefined.**

ChatGPT – a Game Changer



The Singularity



Augmented Reality



Augmented Reality



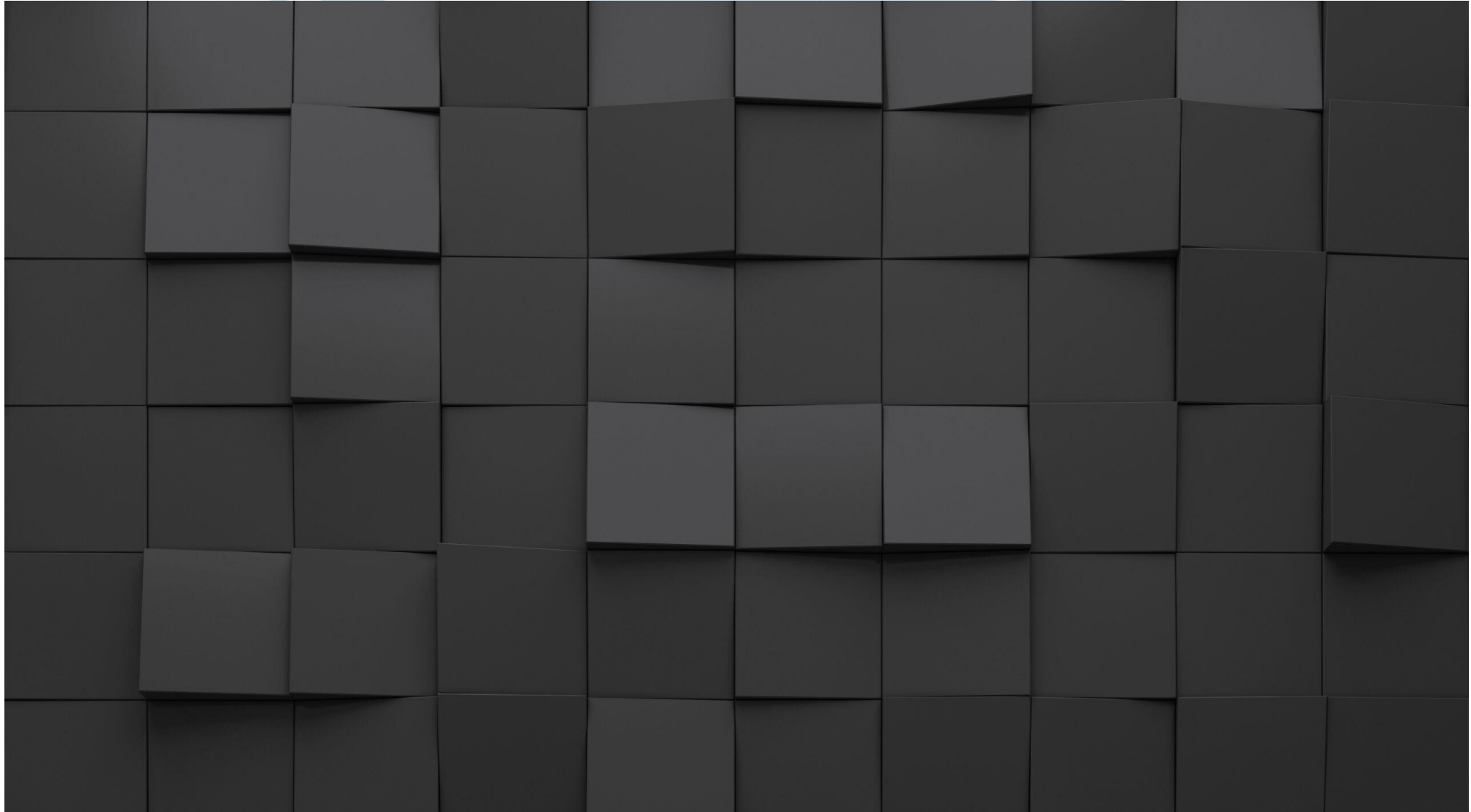
Virtual Reality



Big Data



The Black Box Effect

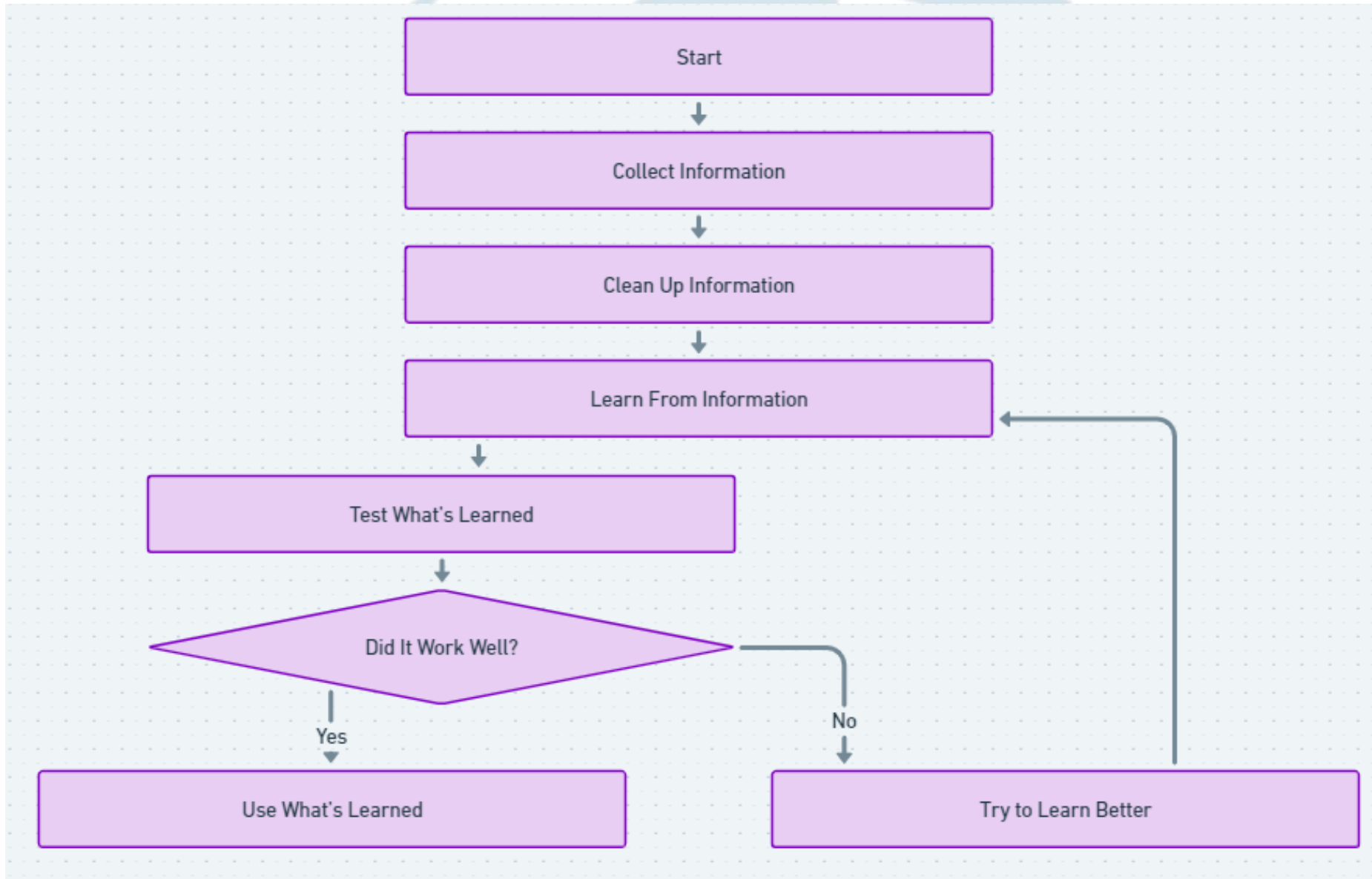


The Black Box Effect

Machine Learning

- A branch of artificial intelligence with focus on predictive algorithms.
- Techniques: Supervised learning, unsupervised learning, and reinforcement learning.
- Applications: Spam filtering, recommendation systems, and self-driving cars.

Machine Learning



Google Teachable Machine

[About](#)

[FAQ](#)

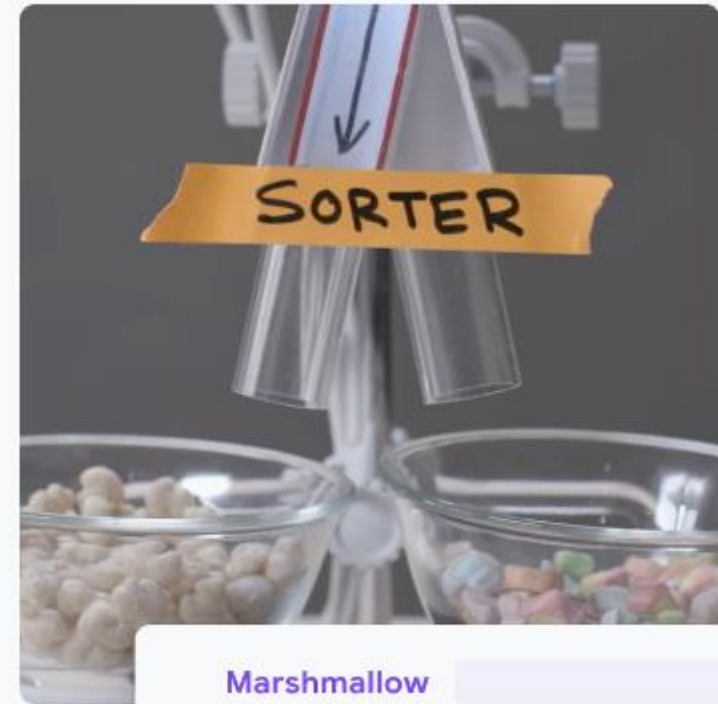
[Get Started](#)

Teachable Machine

Train a computer to recognize your own images, sounds, & poses.

A fast, easy way to create machine learning models for your sites, apps, and more – no expertise or coding required.

Get Started



Marshmallow

Not Marshmallow

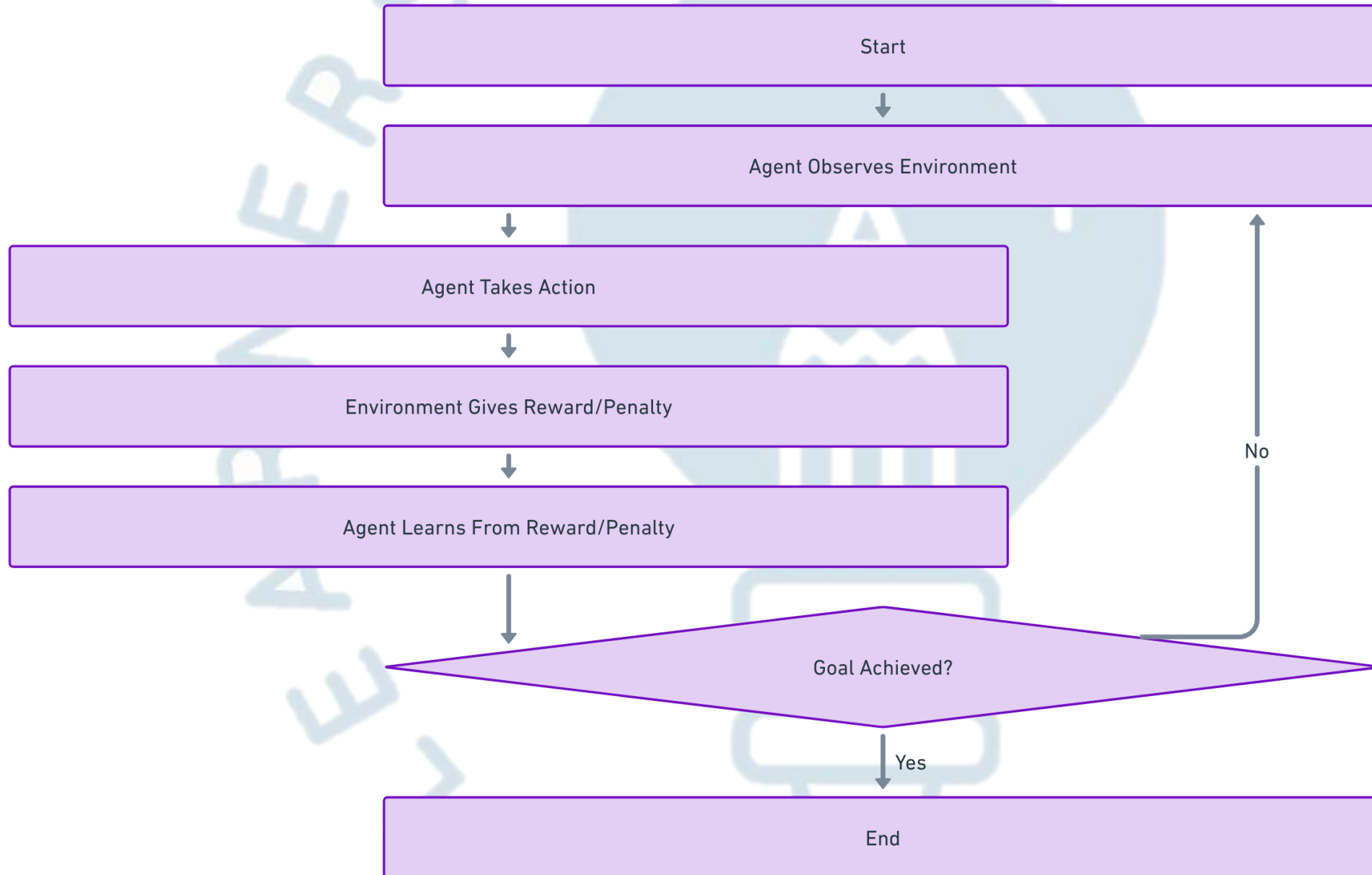
100%

AI Applications for Learning

Reinforcement Learning

- Learning through interaction with an environment, receiving rewards or penalties.
- Maximize cumulative rewards over time, learning optimal policy for decision-making.
- Applications: Robotics, game playing, and resource allocation.

Reinforcement Learning

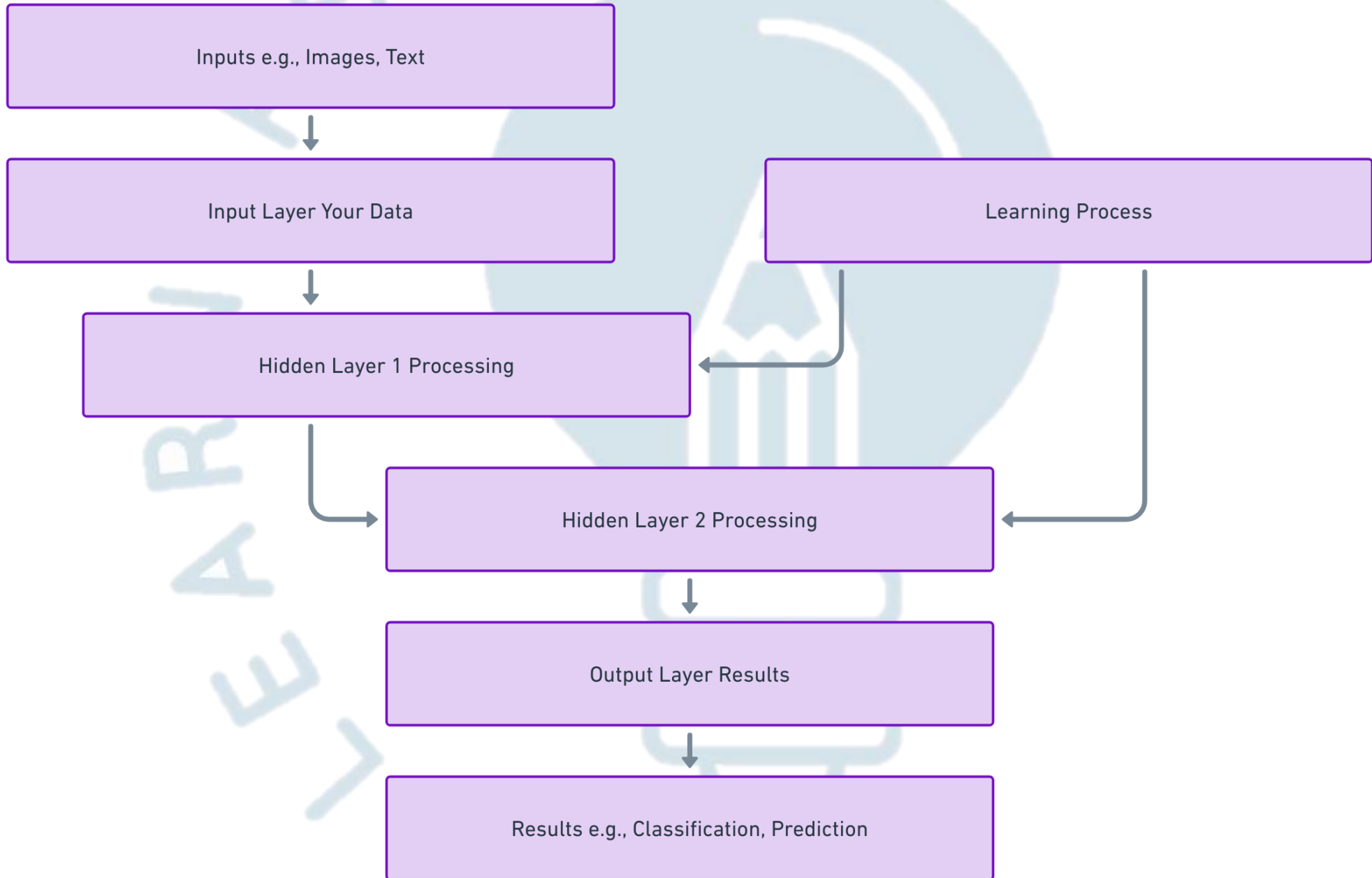


AI Applications for Learning

Neural Networks

- **Interconnected layers of artificial neurons designed for data processing and learning.**
- **Mechanism: Adjusts connection weights through training for pattern recognition and decision-making.**
- **Role: Fundamental component of modern AI applications.**

Neural Networks

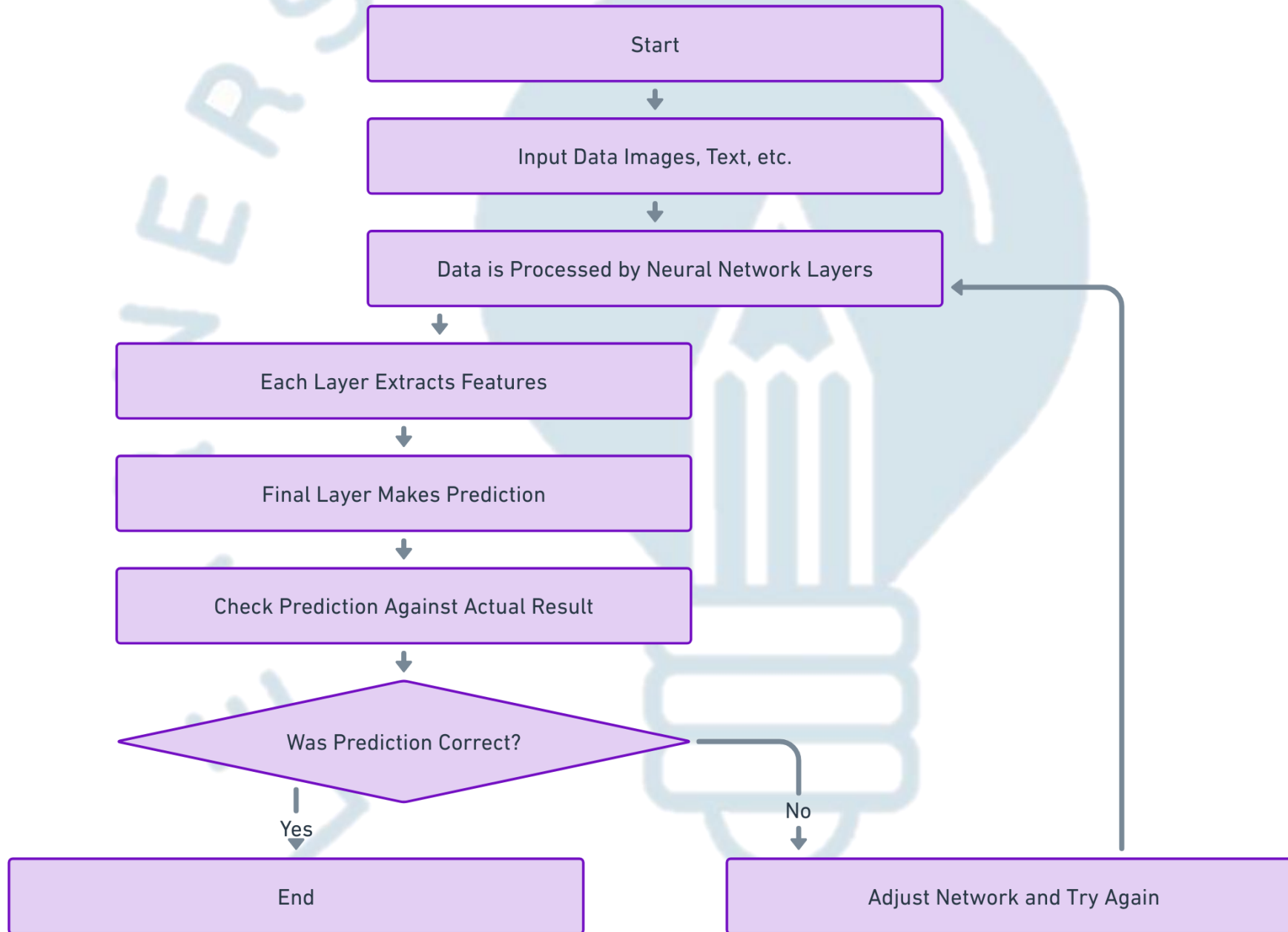


AI Applications for Learning

Deep Learning

- A subset of machine learning focusing on complex patterns in data.
- Tools: Utilizes multi-layered artificial neural networks.
- Specializations: Excels in tasks like image recognition, natural language processing, and speech recognition.

Deep Learning



AI Applications for Learning

Natural Language Processing (NLP)

- A subfield of AI enabling computers to comprehend and generate human language.
- Techniques: Text analysis, sentiment detection, and machine translation.
- Applications: Chatbots, voice assistants, and automated content generation.

AI Applications for Learning

Some basic terms and definitions

- ChatGPT is a Generative Pre-Trained Transformer.
- Created by OpenAI.
- Language Model based on Deep Learning.

AI Applications for Learning

ChatGPT

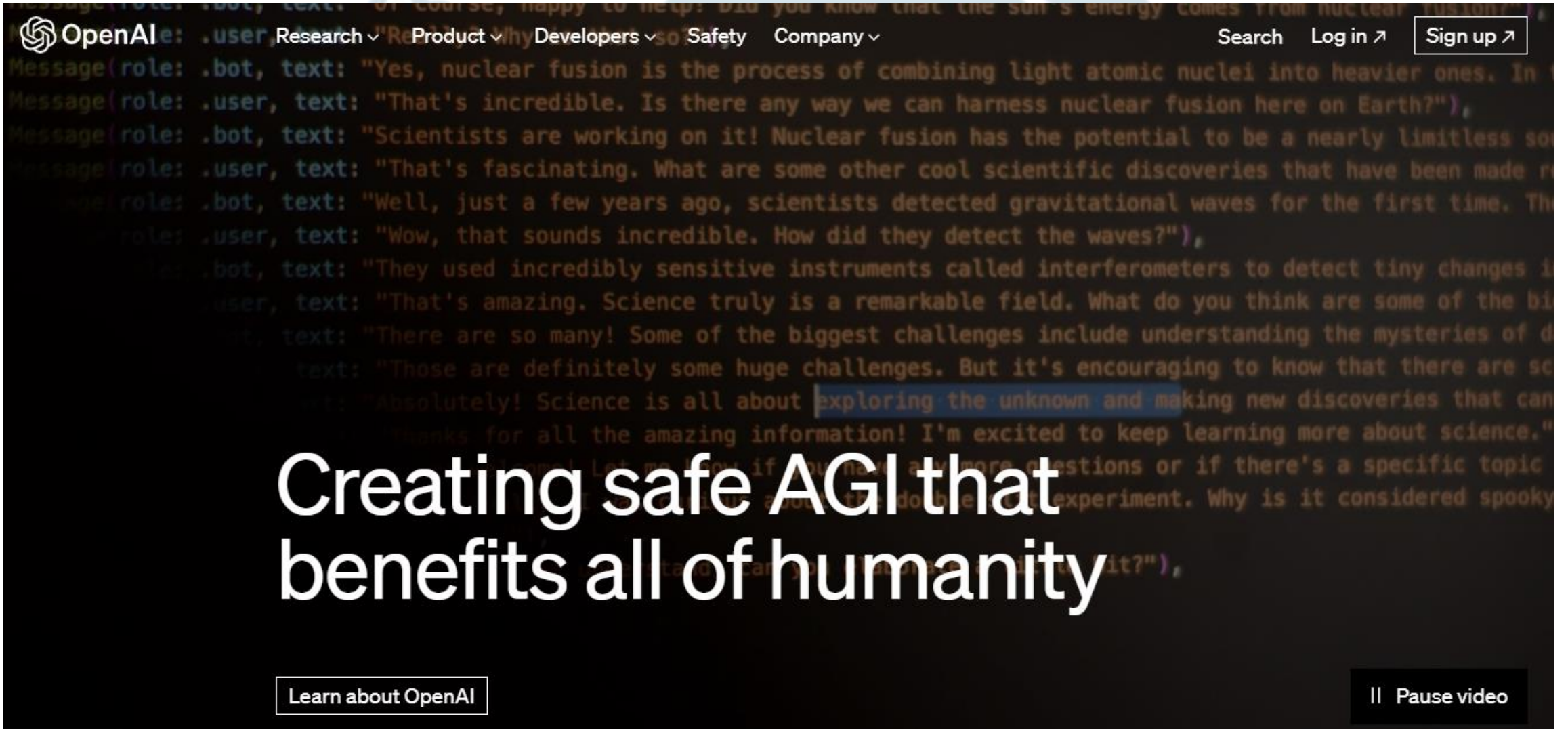
- Deep Learning Neural Network.
- Reinforcement learning, based on human feedback, was used for training.
- Most advanced Natural Language Processing model ever.

AI Applications for Learning

Biases and human reinforcement

- Early models presented biases from data corpora.
- Gender biases.
- Racial and ethnic biases.
- De-biasing.

OpenAI



The screenshot shows the OpenAI website interface. At the top left is the OpenAI logo and name. To the right are navigation links: Research, Product, Developers, Safety, and Company. Further right are Search, Log in, and Sign up buttons. The main content area displays a chat conversation with a dark background and light text. The chat history includes several messages from both user and bot, discussing nuclear fusion and scientific challenges. The phrase "exploring the unknown and making new discoveries that can" is highlighted in blue. At the bottom of the chat area, there is a text input field and a "Send" button. Below the chat area, there are two buttons: "Learn about OpenAI" and "Pause video".

OpenAI: .user, Research Product Developers Safety Company Search Log in Sign up

Message(role: .bot, text: "Of course, happy to help! Did you know that the sun's energy comes from nuclear fusion?"),

Message(role: .user, text: "That's incredible. Is there any way we can harness nuclear fusion here on Earth?"),

Message(role: .bot, text: "Yes, nuclear fusion is the process of combining light atomic nuclei into heavier ones. In"),

Message(role: .user, text: "That's fascinating. What are some other cool scientific discoveries that have been made r"),

Message(role: .bot, text: "Scientists are working on it! Nuclear fusion has the potential to be a nearly limitless so"),

Message(role: .user, text: "That's amazing. Science truly is a remarkable field. What do you think are some of the bi"),

Message(role: .bot, text: "Well, just a few years ago, scientists detected gravitational waves for the first time. Th"),

Message(role: .user, text: "Wow, that sounds incredible. How did they detect the waves?"),

Message(role: .bot, text: "They used incredibly sensitive instruments called interferometers to detect tiny changes i"),

Message(role: .user, text: "There are so many! Some of the biggest challenges include understanding the mysteries of d"),

Message(role: .bot, text: "Those are definitely some huge challenges. But it's encouraging to know that there are se"),

Message(role: .user, text: "Absolutely! Science is all about exploring the unknown and making new discoveries that can"),

Message(role: .bot, text: "Thanks for all the amazing information! I'm excited to keep learning more about science."),

Message(role: .user, text: "Let me know if you have any more questions or if there's a specific topic"),

Message(role: .bot, text: "I'd be happy to help! Feel free to ask me anything. Why is it considered spooky"),

Message(role: .user, text: "It?"),

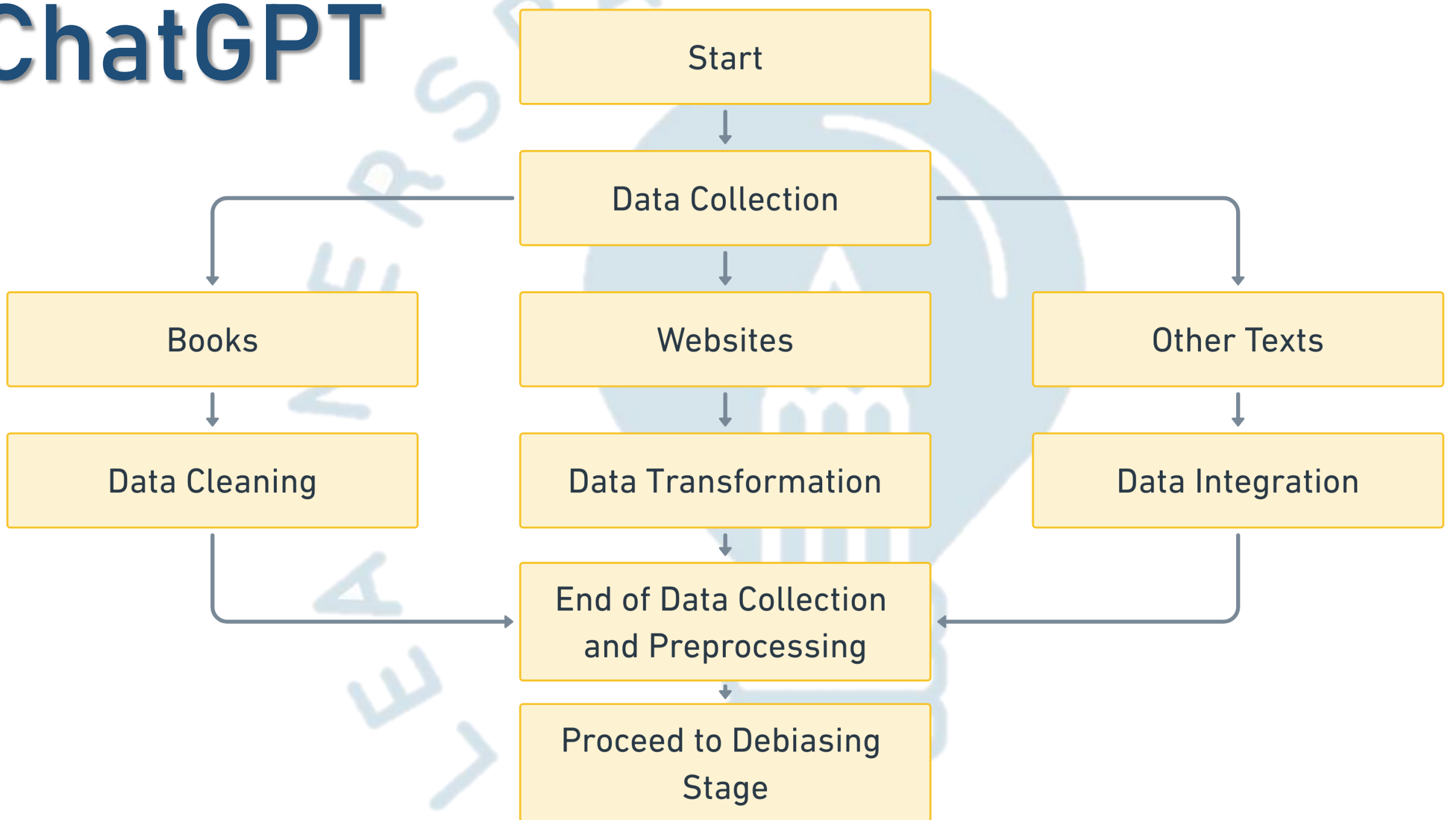
Learn about OpenAI Pause video

AI Applications for Learning

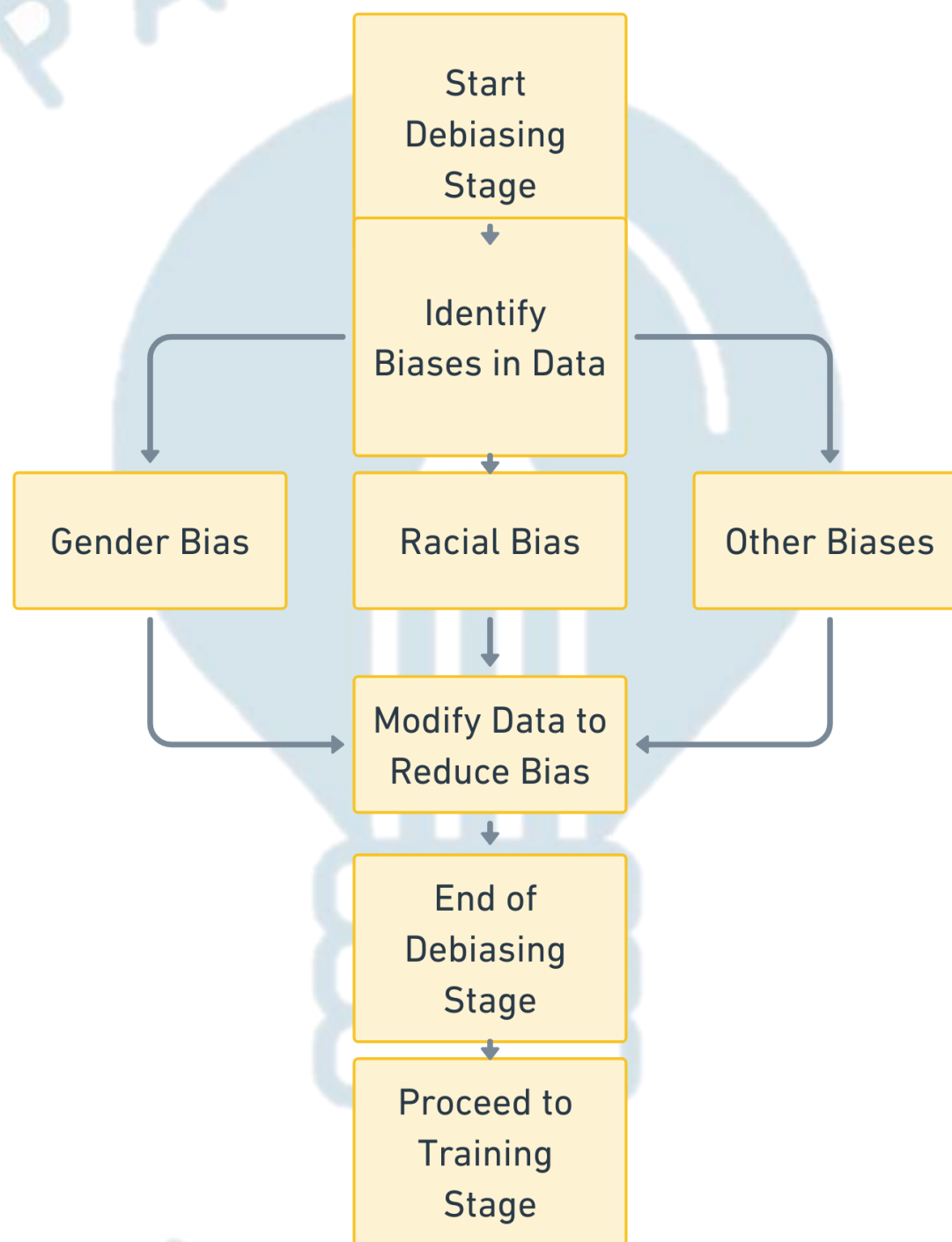
Risks of neural networks

- Pneumonia research – rules model vs. neural networks.
- Opaqueness of model vs. accuracy.
- Transparency initiatives / EU AI Act.
- Do people have the right to explanations when algorithmic decisions are made?

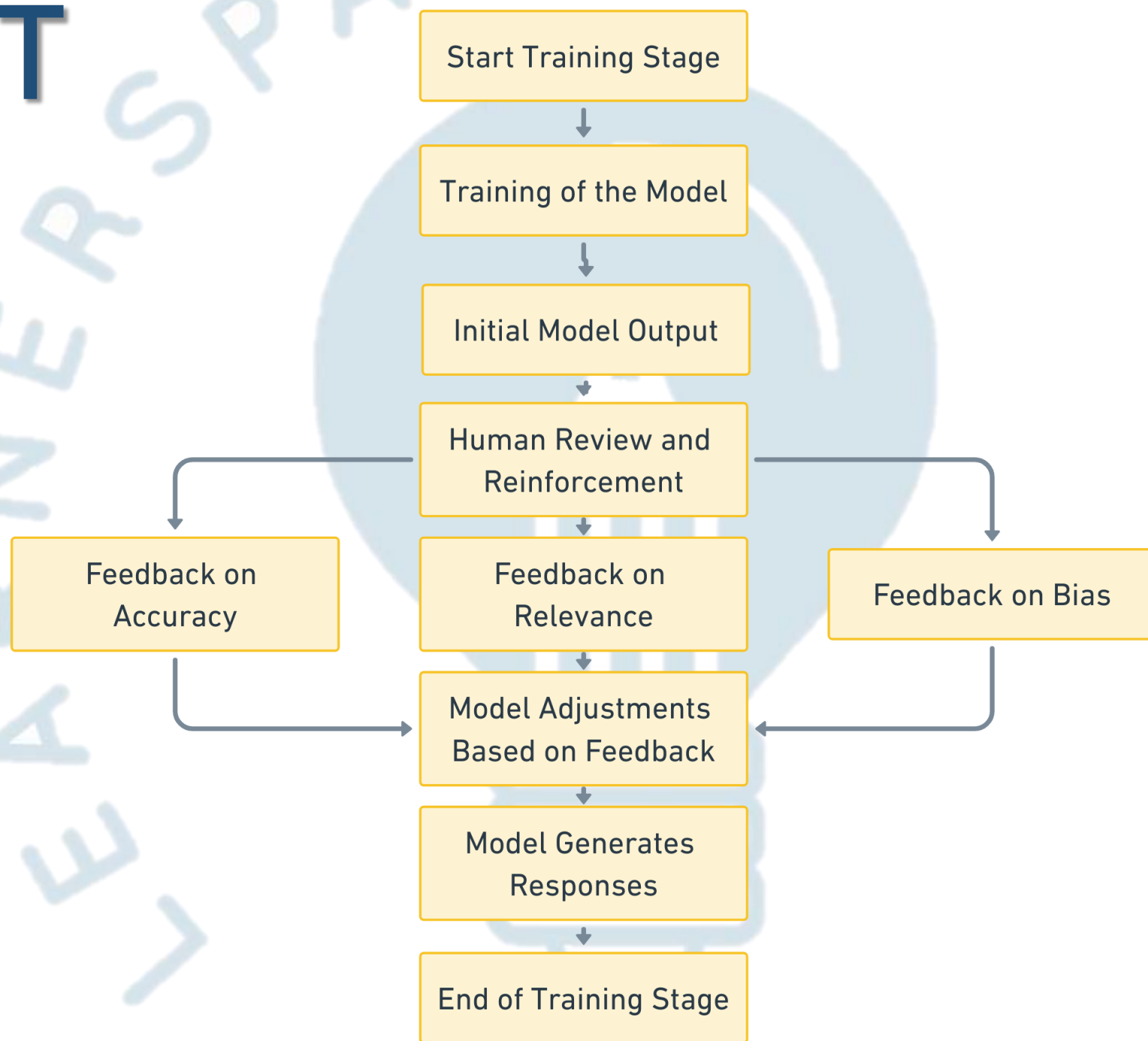
ChatGPT



ChatGPT



ChatGPT



AI Applications for Learning

ChatGPT is only the beginning...

- Technology Applications that will revolutionize life and learning.
- The Black Box Effect.
- **Applications to Learning.**
- Ethical and social implications.

ChatGPT & apps family

General Purpose Applications

- **An All-Encompassing Expert in All Areas**
- **A Personalized Tutor**
- **Transcription**
- **Summarization**

ChatGPT & apps family

General Purpose Applications

- **Simplification**
- **Special Needs and Learning Difficulties**
- **Research**
- **Coding**
- **Images, Videos, and Presentations**

ChatGPT & apps family

General Purpose Applications

- Text to Speech
- New Content Generation
- Conversations
- Impersonating Famous Characters
- Case study

ChatGPT & apps family

Applications for Reading

- Summarize Texts of Any Length
- Reading Comprehension Assistance
- Rewrite Texts for Different Age/Grade Levels
- Extract Main Ideas in Various Formats

ChatGPT & apps family

Applications for Reading

- **Personalized Reading Plans**
- **Identify Entities and References**
- **Rewrite for Special Learning Needs**
- **Rewrite to Change Tone or Customize for Emotional Issues**
- **Perform Sentiment Analysis**

ChatGPT & apps family

Applications for Reading

- Rewrite in the Style of Any Writer
- Text-to-Speech Conversion
- Change Literary Formats
- Rewrite with Alternative Endings or Plot Changes
- Analyze Text for Biases and Hidden Meanings

ChatGPT & apps family

Applications for Writing

- **Generating Outlines for Any Topic or Idea**
- **Unlimited Text Generation in Various Styles and Lengths**
- **Text Rewriting for Improvement or Style Change**
- **Inclusion of References and Citations**

ChatGPT & apps family

Applications for Writing

- **Grammar and Style Correction**
- **Personalized Feedback**
- **Writer's Assistance**
- **Writing Templates**
- **Act as an Editor**

ChatGPT & apps family

Mathematics & Science

- Problem solving and related tutoring.
- Real life applications of topics.
- Experiments - simulation.
- Problems that connect with other topics and/or real life situations.
- Simulated data, variations and errors.

ChatGPT & apps family

Mathematics & Science

- Data analysis through Code Interpreter.
- Forensics and other applications.
- Health science applications.
- Food & Nutrition – diets, nutritional info.
- Lab reports, image creation.
- Project feedback

ChatGPT & apps family

Social Sciences

- Interactive reenactment of events.
- Dialogue with historical figures.
- Interactive tours.
- Going back in time.
- Debates and interviews.

ChatGPT & apps family

Social Sciences

- Hypothetical situations.
- Case studies and problems.
- Simulated data for analysis.

ChatGPT & apps family

Foreign Languages

- Personalized reading materials.
- Dialogue and correction.
- Translation.
- Tour guides.
- Near future – oral conversations.

ChatGPT & apps family

Social Emotional Learning

- **Stories and fictional scenarios.**
- **Dialogues.**
- **Icebreakers and activities related to topics.**
- **Themed meditations.**
- **Simulated mediation and conflict resolution.**

ChatGPT & apps family

Technology

- Code generation.
- Webpage design.
- Debugging and code checking.

AI Applications for Learning

ChatGPT for Data Analysis

- **Explanation of data analysis capabilities with ChatGPT**
- **Examples of data queries: Student performance metrics, admissions, operational issues**
- **Step-by-step guide on posing questions to extract meaningful data**

AI Applications for Learning

Enhancing Writing Efficiency with ChatGPT

- Overview of writing assistance capabilities: Emails, reports, official communications
- How to use ChatGPT to draft and refine school documents
- Document analysis, summarization

AI Applications for Learning

Practical Applications of ChatGPT in School Administration

- **Scenario-based examples: Drafting school newsletters, managing correspondence**
- **Overview of tools and applications**
- **Addressing concerns about reliability and privacy**

AI Applications for Learning

Customizing ChatGPT for Each School's Specific Needs

- Training ChatGPT on specific school data for customized responses
- Creating and deploying custom GPTs

AI Applications for Learning

Scheduling

 reclaimai



motion

AI Applications for Learning

Minutes and notetaking



mem

AI Applications for Learning

Social media – Content



AI Applications for Learning

Multimedia and Presentations

**|| Eleven
|| Labs**

beautiful.ai

AI Applications for Learning

GPTs



PDF Ai PDF



Diagrams: Show Me | charts, presentations,
code

Ethical and social implications

AI Image Generation

- **Is it Art?**
- **Concerns for digital art industry.**

Ethical and social implications

AI Image Generation

- **Misuse and Misrepresentation of AI-Generated Images**
- **Privacy and Consent Concerns**
- **Deepfakes and Non-consensual Content Issues**
- **Bias and Stereotypes in AI Image Generation**

Ethical and social implications

AI Image Generation

- **Ownership and Intellectual Property Rights Challenges**
- **Authenticity and Trust Concerns in Visual Media**
- **Psychological and Emotional Impact of AI-Generated**

Ethical and social implications

AI and advanced tech applications

- Unaddressed important implications of tech advances.
- Students are generally unaware of some of the deeper issues related to technology.
- These range from ethical dilemmas and deep fakes to privacy issues.

MIT Moral Machine



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The COVID-19 crisis has forced people to confront difficult ethical challenges. If you are comfortable answering a few brief questions on this topic, please click [here](#).



[COVID-19](#)



Moral Machine - Human Perspectives on Machi...



Watch later



Share



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My Goodness MIT

Welcome to MyGoodness!

There are over [one million](#) registered charities in the United States alone, and many more worldwide. How do you choose among them?

MyGoodness is a simple game that helps you understand how you give. In the game, you will make 10 giving decisions. Each decision is between two choices, and you tell us which you prefer.

At the end of the game, we give you a summary of your 'goodness' and how it compares to others. You can share that feedback with whomever you would like.



Start Game!

View instructions (recommended)

MIT Detect Fakes

Detect Fakes

About

Informed Consent

Can you spot the DeepFake video?



Harvard Project Implicit



Project Implicit

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Gender-Career IAT

Gender - Career. This IAT often reveals a relative link between family and females and between career and males.

Asian IAT

Asian American ('Asian - European American' IAT). This IAT requires the ability to recognize White and Asian-American faces, and images of places that are either American or Foreign in origin.

Weapons IAT

Weapons ('Weapons - Harmless Objects' IAT). This IAT requires the ability to recognize White and Black faces, and images of weapons or harmless objects.

Sexuality IAT

Sexuality ('Gay - Straight' IAT). This IAT requires the ability to distinguish words and symbols representing gay and straight people. It often reveals an automatic preference for straight relative to gay people.

Disability IAT

Disability ('Physically Disabled - Physically Abled' IAT). This IAT requires the ability to recognize figures representing physically disabled and physically abled people.

Native IAT

Native American ('Native - White American' IAT). This IAT requires the ability to recognize last names that are more likely to belong to Native Americans versus White Americans.

Weight IAT

Weight ('Fat - Thin' IAT). This IAT requires the ability to distinguish faces of people who are obese and people who are thin. It often reveals an automatic preference for thin people relative to fat people.

Age IAT

Age ('Young - Old' IAT). This IAT requires the ability to distinguish old from young faces. This test often indicates that Americans have automatic preference for young over old.

Gender-Science IAT

Gender - Science. This IAT often reveals a relative link between liberal arts and females and between science and males.

"Terrific. . . . Art and science meet an engaged mind
and the friction produces real fire." —*The New Yorker*

*The Most
Human*

Human



What

Artificial Intelligence

Teaches Us About Being Alive

B r i a n C h r i s t i a n

Conclusions - Discussion

This is just the beginning

- **ChatGPT elevates the threshold of cognitive skills at every level.**
- **What constitutes cheating?**
- **Different standards for adults and students?**

Conclusions - Discussion

This is just the beginning

- Which learning / cognitive skills do we need to build up to?
- How are they learned?
- Reassessing assessment, including international exams.
- Current events post Sept 2021 - limitations

Conclusions - Discussion

Implications

- **Redefine cognitive skills per age level.**
- **Closed tech sessions – oral discussions – not pen and paper.**
- **Pre-ChatGPT analysis.**
- **Fact checking and verification.**
- **Creative tasks.**

Conclusions - Discussion

Risks

- **Some cognitive skills at risk.**
 - Reading comprehension.
 - Summarization.
 - Breaking down a real life problem.
- **ChatGPT outperforming students at many age levels.**

Conclusions - Discussion

Benefits

- We can learn a whole lot more.
- Very significant step towards democratization of knowledge.
- Higher threshold for learning skills.
- AI unleashed for human good.

What's next?





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