

# Artificial Intelligence in the University

Challenges, opportunities and proposals  
+ Ethos+Tekhne school: a new generation of  
AI researchers.



Alliance members



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# Schedule of the session

## I. AI in Teaching (60min)

- Presentation of the session
- Introduction to AI
- Testimonials:
  - Dumitru Denis (Student, UPB)
  - Jesús Salgado (Professor, UPM)
  - Anonymous testimonials
- Brainstorming
- Recap

## II. Ethos Tekhne (30min)

- Presentation of “Ethos+Tekhne” EELISA school (I edition)
- Roundtables for II edition:
  - Topics and learning methods
  - Collaborations for II edition
- Brainstorming on network to train AI researchers



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# Artificial Intelligence in Teaching

Challenges, opportunities and  
proposals

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# Objectives of the session

- To identify the main challenges that the Artificial Intelligence has already brought to the University
- To detect opportunities new technologies will offer to us.
- To share proposals or ideas that different colleagues might have implemented (or intend to do) in their Universities in order to overcome challenges and seize opportunities.



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# IN PRESS

## ChatGPT ban in Australia's public schools likely to be overturned

Government reveals a draft framework has been formulated for how ChatGPT rollout will work in schools

<https://www.theguardian.com/technology/2023/jul/09/chatgpt-ban-in-australias-public-schools-likely-to-be-overturned>

## EXCLUSIVE: 'Half of school and college students are already using ChatGPT to cheat': Experts warn AI tech should strike fear in all academics

- Many school districts have already banned the use of ChatGPT
- GPT-4 can score 90 percent on many exams already including the American bar
- **READ MORE:** We test out the new GPT-4 and it's astounding

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By ROB WAUGH TECH CORRESPONDENT FOR DAILYMAIL.COM

UPDATED: 18:41 BST, 26 March 2023

<https://www.dailymail.co.uk/sciencetech/article-11899475/Half-students-using-ChatGPT-cheat-rise-90.html>

## ChatGPT: Can students pass using AI tools at university?

<https://www.bbc.com/news/education-65316283>



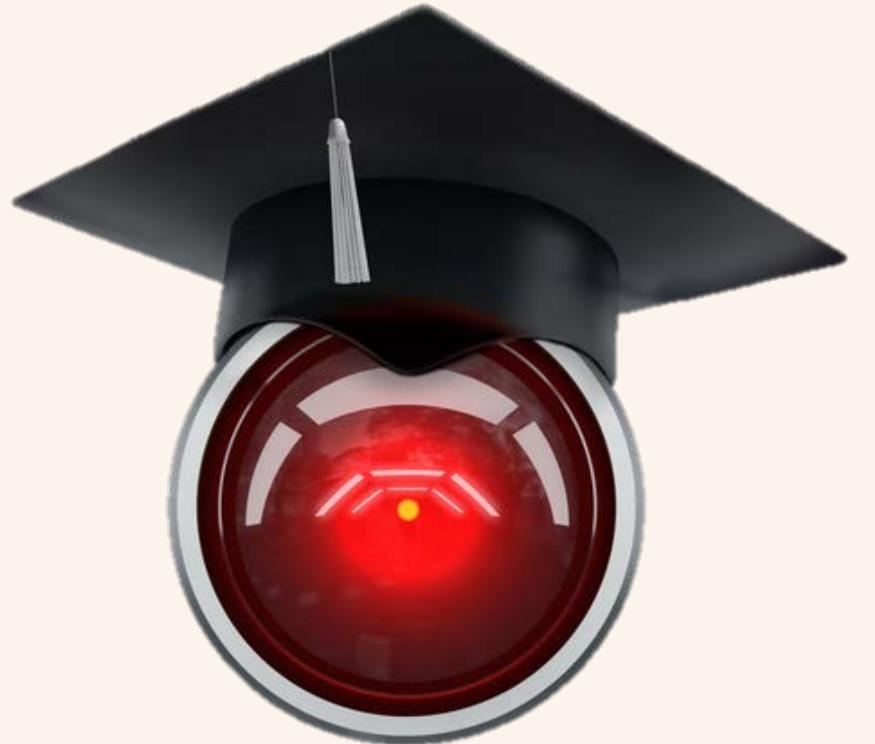
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# But how does (generative) AI work?

An example: ChatGPT

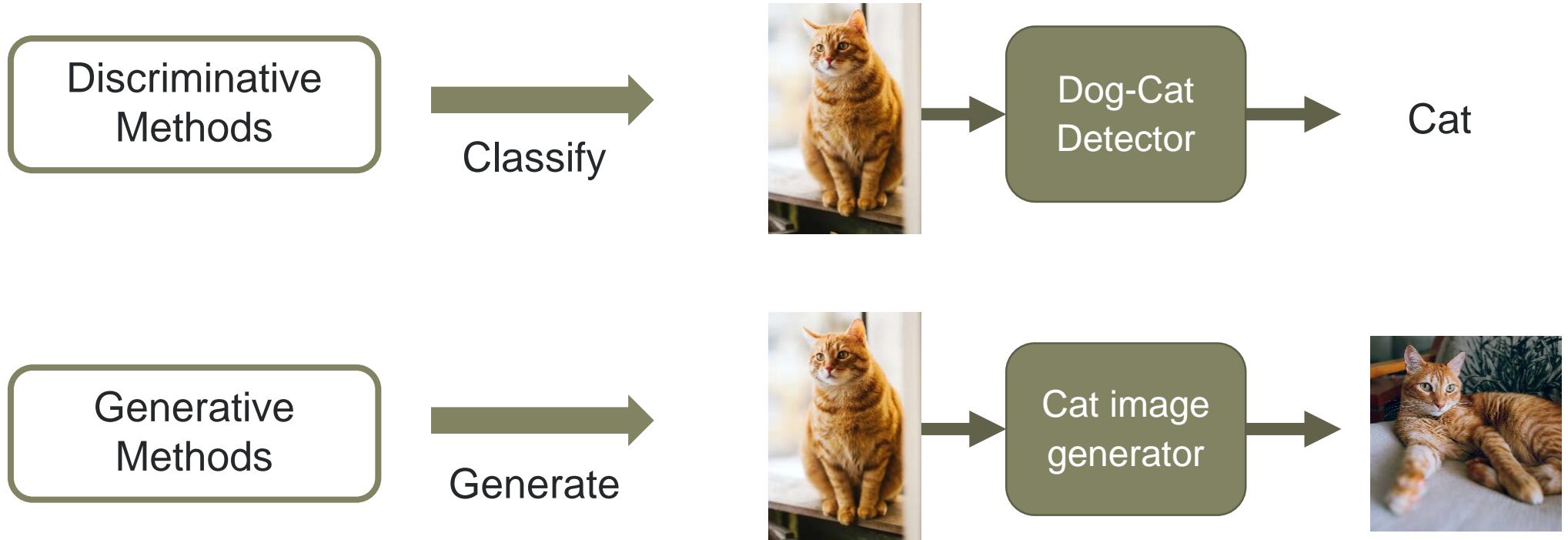


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# Generative AI

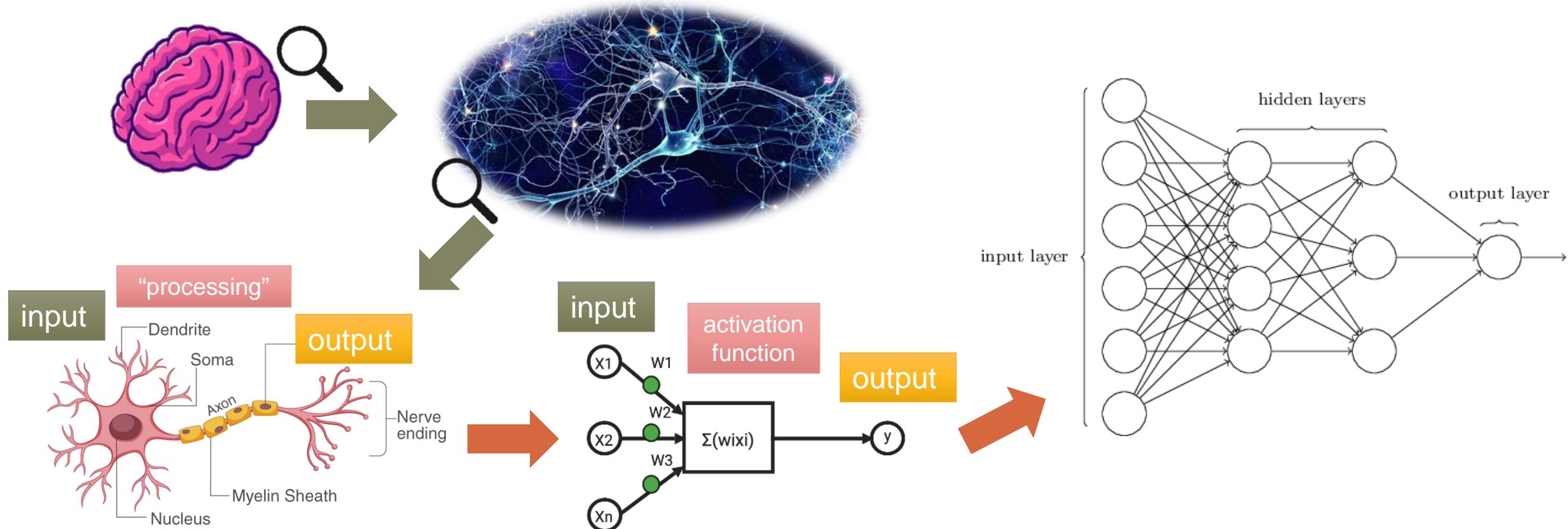
New data is created from training data



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# Context: Neural networks



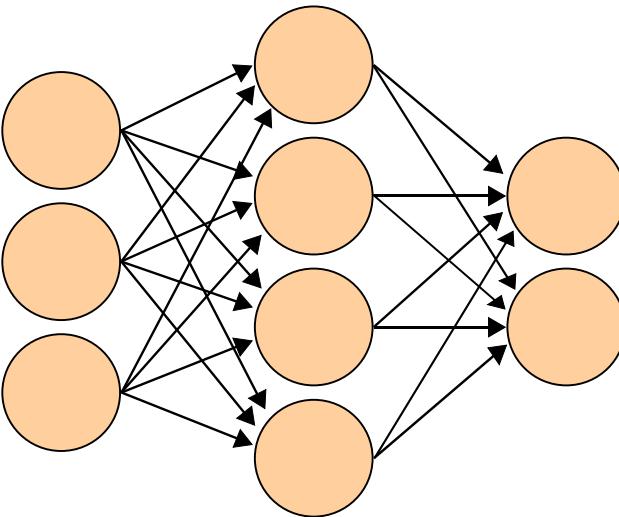
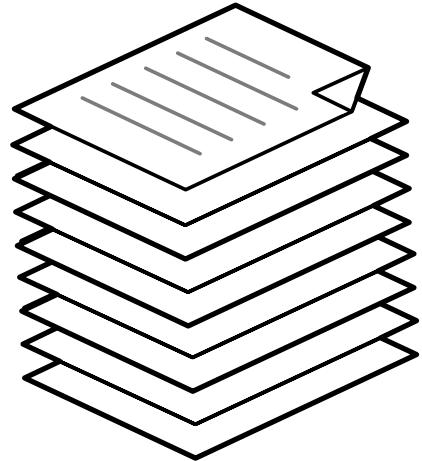
Images from <https://www.freepik.com/vectors/> and  
[https://commons.wikimedia.org/wiki/File:Artificial\\_neural\\_network.svg](https://commons.wikimedia.org/wiki/File:Artificial_neural_network.svg)



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# Step 1. Base model



Large Language  
Model (LLM)

HUGE  
amount of  
text (TB!)

HUGE Neural  
Network (billions  
of parameters)

- Predicts next word
- Learned certain statistical patterns (e.g. words that usually go together)
- Good at language => good at thought fallacy!



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## Step 2. Fine tuning

- Now we have a language model able to “speak”; fine-tuning means “training” it for a specific task/domain modifying just some parts (usually last layers).
- Examples:
  - We want the model to classify tweets in positive/negative: we “retrain” (fine-tuning) with positive and negative tweets.
  - We want it to chat with people: we make it **interact with people** who return the “correct” output when it is wrong (ChatGPT!); this is called Human Based Reinforcement Learning.



It is like if we had a person that already knows to read Spanish and taught them to classify texts, or about a specific domain.



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### Step 1

Collect demonstration data and train a supervised policy.

A prompt is sampled from our prompt dataset.

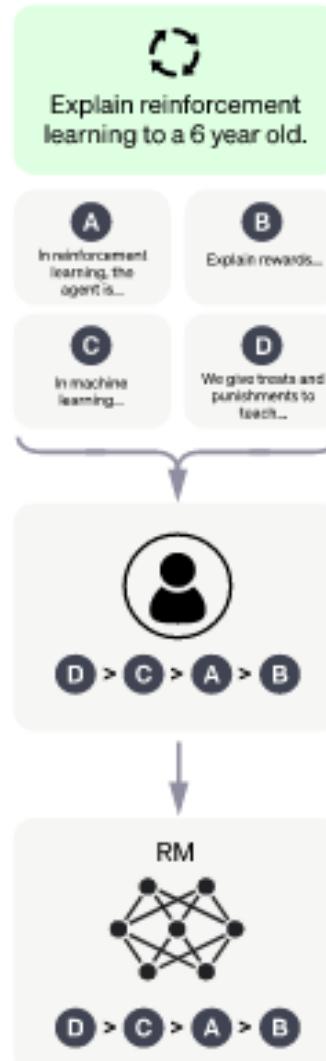


A labeler demonstrates the desired output behavior.

### Step 2

Collect comparison data and train a reward model.

A prompt and several model outputs are sampled.



A labeler ranks the outputs from best to worst.

This data is used to train our reward model.

### Step 3

Optimize a policy against the reward model using the PPO reinforcement learning algorithm.

A new prompt is sampled from the dataset.



# Many more!

## Text Generation

[ChatGPT](#), Bing, BARD, [Claude](#)...

## Image Generation

[DALL-E 2](#), [Stable Diffusion](#),  
[Midjourney](#)...

## Video/Audio/Music Generation

[Synthesia](#), [DeepBrain](#), [JukeBox](#),  
[VALL-E](#)...

Slide building, email drafter,  
(educational) bot creation...



# Wanna know more?

- <https://openai.com/blog/chatgpt>
- <https://youtu.be/4qGrteTY1EM>
- <https://youtu.be/bSvTVREwSNw>



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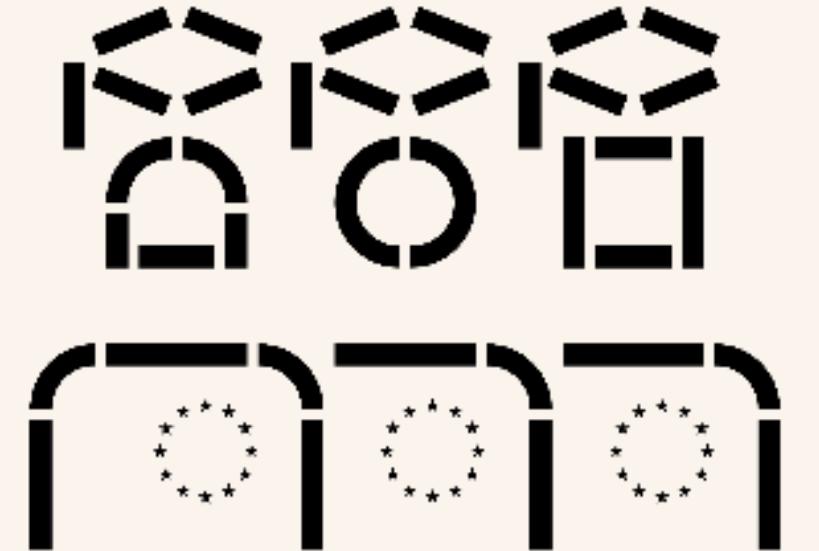
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# Testimonials

Dumitru Denis (student)  
Universitatea Politehnica din Bucureşti

Jesús Salgado (researcher)  
Universidad Politécnica de Madrid

Three anonymous professors  
(from the form distributed among EELISA)



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# Testimonial 1



I use ChatGPT as a **co-programmer** to reduce my programming time for demos and demonstrations. In one day I can do something that in other cases could have taken more than two days.

I also use ChatGPT for **reduce bureaucracy** in terms of creating summaries of my work, when I have all the different points explained or summaries of ideas that I had detailed in a proposal.

Also I'm starting to use ChatGPT to **retrieve ideas for lessons and interesting examples**"



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## Testimonial 2 (I)



In my opinion, ChatGPT can be a good tool for learning, although the **student should always be aware that the results may be incorrect** and not lose sight of the fact that it is **a tool, not a substitute**. My recommendation is that the teacher should **dedicate some sessions** to reinforce this aspect, and help the student to use it (asking the right questions)."



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## Testimonial 2 (II)



In my subject [*Computer Science*], students **used ChatGPT when taking the exam**. A very common fault was that the students **copied the code directly, without testing** or integrating it into the code they already had. This led to the introduction of a multitude of syntactic errors that they were unable to fix in the code. It also happened that the **solution did not match what was asked** for in the statement.



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# Testimonial 3 (I)



ChatGPT is used to **explore in a first approach** the available contents in the question under analysis. This means to create a **preliminary overview** before proceeding to the extension analysis by the student that concerns to the matter under development.



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## Testimonial 3 (II)

“ A first idea comes from the extended use of Wikipedia for students and how ChatGPT is "friendly" adopted by them.

For instance when a **collaborative task** is endorsed to the students, **ChatGPT can help them to get the statement of the achievements** in the technical framework while **the student has to encourage a particular technological analysis from this framework**. An example is the decarbonization in transport: what is the possible uses of alternative materials to the fossil fuel or what is the use of hydrogen in transport while the student is requested to define the needs in a particular application to be developed.”



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# Testimonial 3 (III)



For advanced student works, as master thesis, a question to remark is the availability of this tool to **explore different areas out of the expertise of the student to find similarities for a common methodology of analysis**. One example is to compile good practices to be used in the creation of a value chain in the question under analysis.

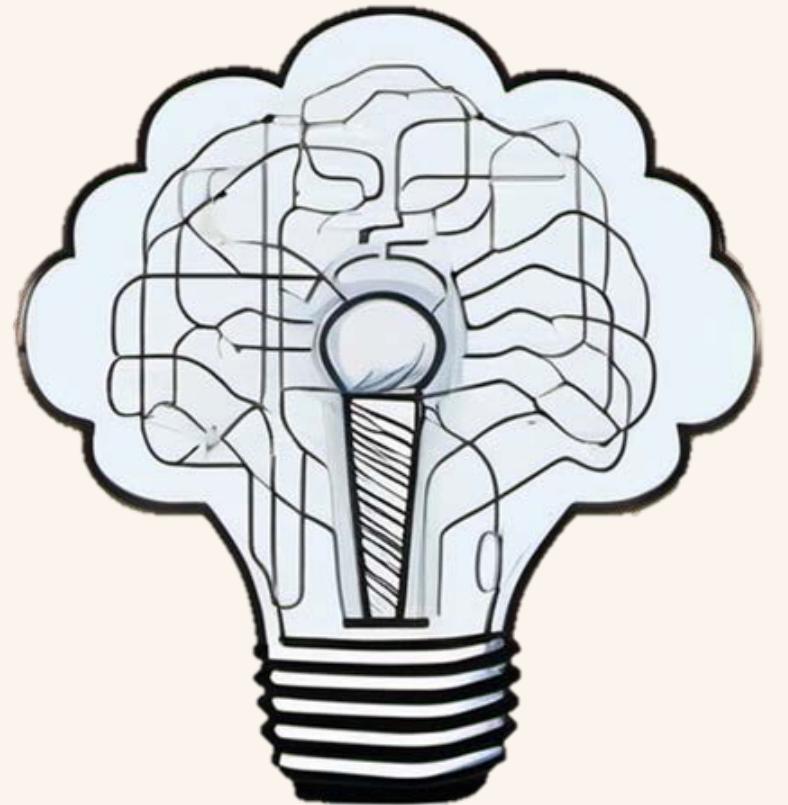


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# Brainstorming

Challenges  
Limitations  
Proposals  
Questions  
Collaborations



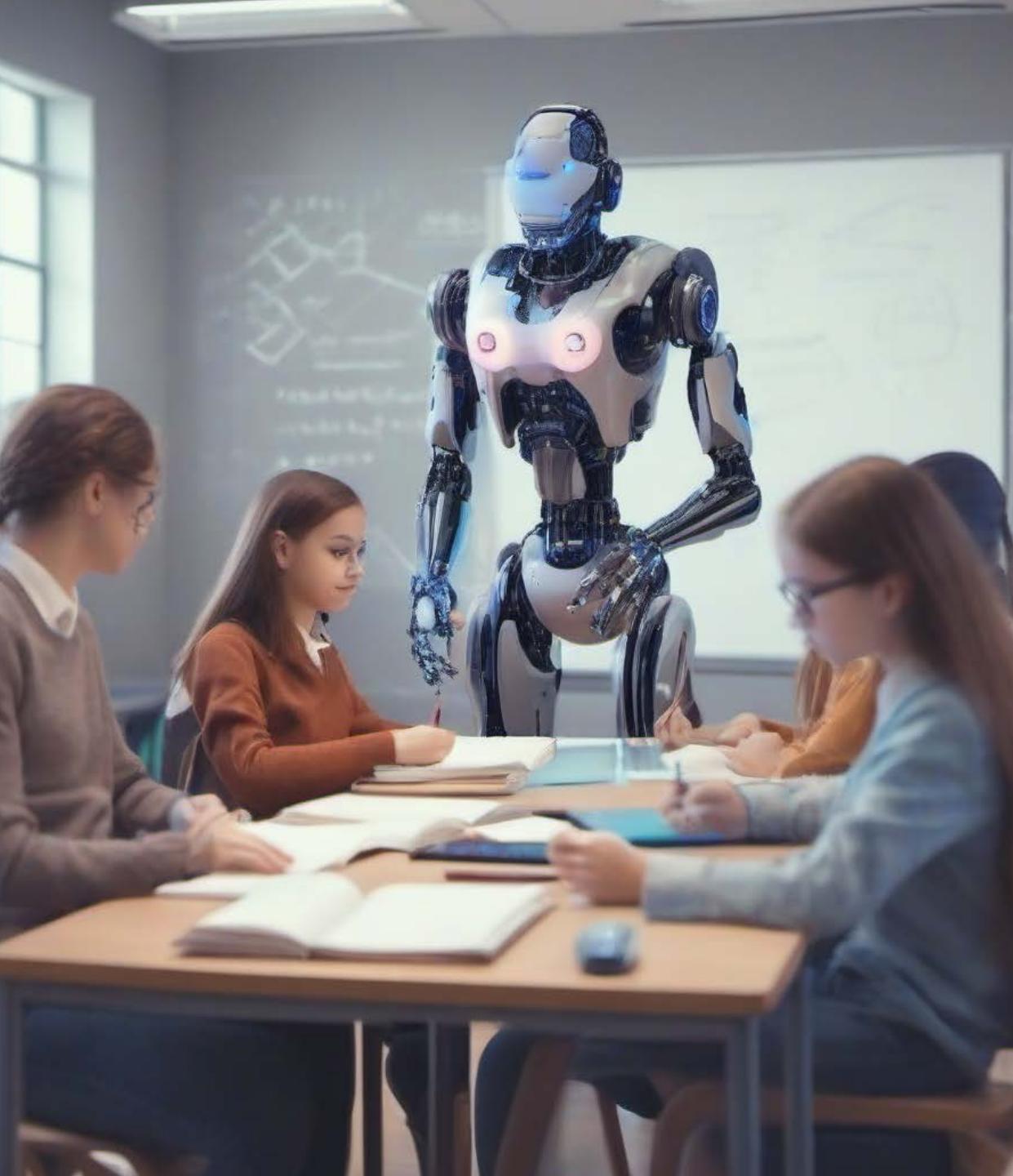
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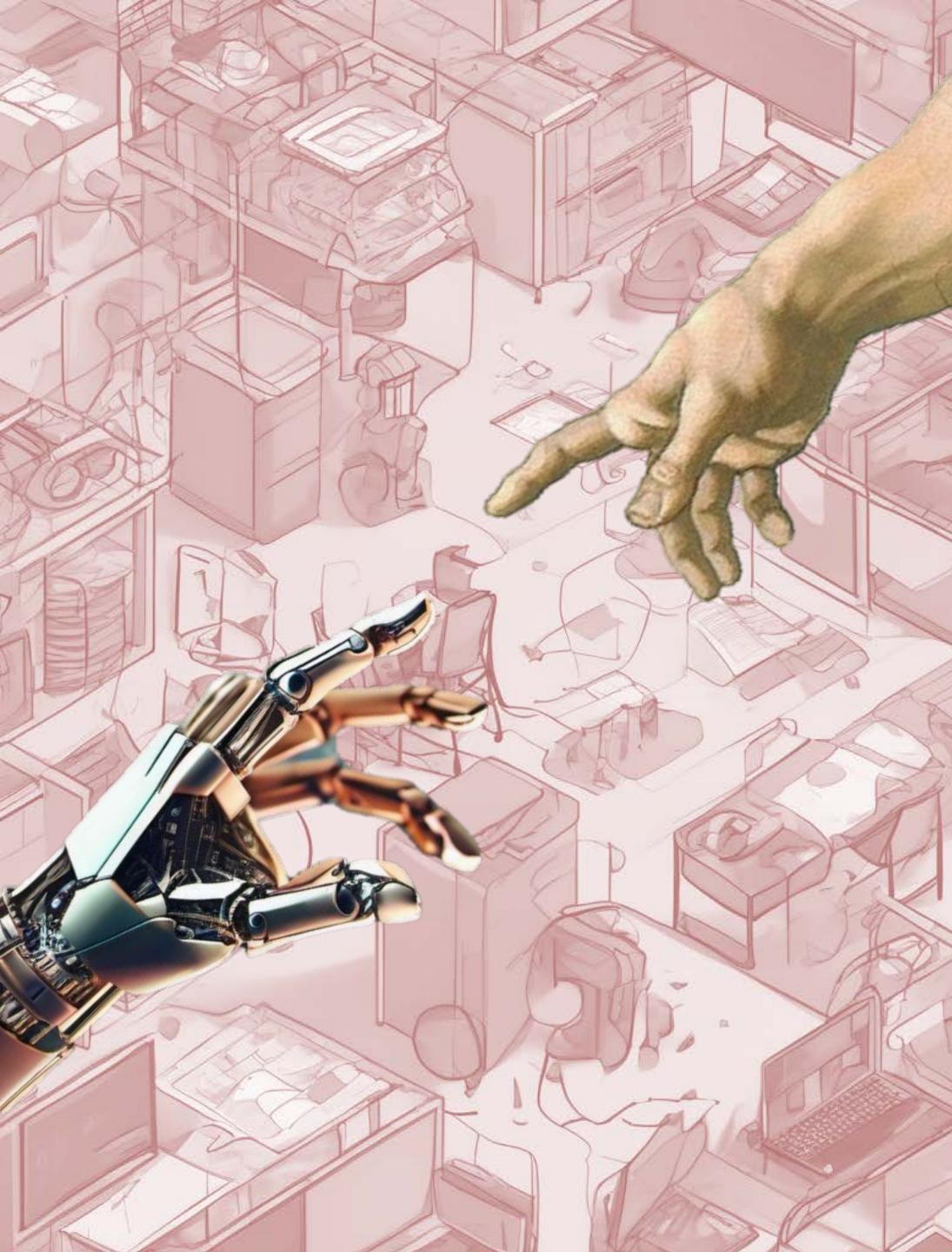
# CHALLENGES

- *Students cheating*
- *No critical thinking*
- *Unified input to students*
- *Non standard education*
- *We need to change how students are examined*
- *New roles of professors*



# LIMITATIONS

- *No thinking! Too verbose*
- *Emergency under analysis.*
- *Hallucinations! Including sources/references.*
- *Biases*
- *Pay to access to upgraded models*
- *Dependency to external provider (not always), too changing*



# OPPORTUNITIES

- *Async, online learning*
- *Personalized learning*
- *Interactive examples*
- *Personalized feedback from students*
- *Repetitive task alleviation*
- *Paperwork*
- *+ design time, - implementation work*

Credit:  
StableDiffusionxl\_base\_1.0  
+ Michelangelo



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# BRAINSTORMING

- Solving doubts about AI tools: freely ask/answer questions.
- Discussing main fears and how to tackle them.
- Possible activities with students.
- Use tools to save time regarding repetitive tasks.

*Objective: a list of possible actions and recommendations to make the most of AI.*

*Establishment of collaboration network to collect examples and update this list.*

*Would you be interested in dedicated events on the topic?(e.g. workshops/schools).*



Credit:  
StableDiffusion  
xl\_base\_1.0

<https://short.upm.es/s46u8>



# CONCLUSIONS

- *This goes fast! – see the image!*
- *We need to adapt, to make use of the tools*
- *We can share resources, tricks, maybe organize seminars...*
- *It is almost impossible to keep updated: let's advance all together.*



Credit:  
Bing+DALL-E



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# THANK YOU !

☺ I will be here today and tomorrow, feel free to talk to me

@ Reach me by email at [mnavas@fi.upm.es](mailto:mnavas@fi.upm.es)

👉 We can meet in person if you come to Madrid!