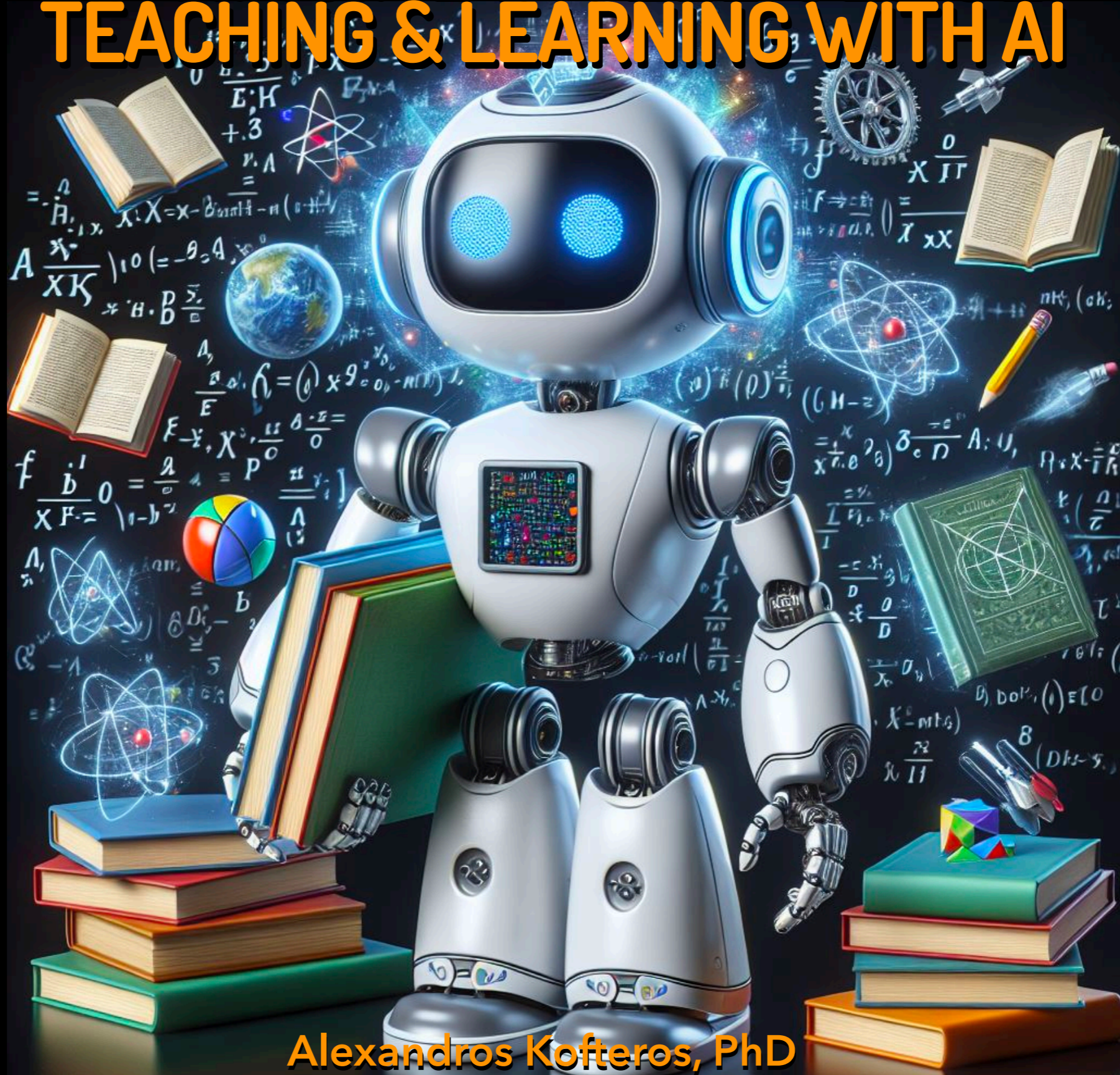


An introductory guide for using AI in education

# ARTIFICIAL INTELLIGENCE: TEACHING & LEARNING WITH AI



Alexandros Kofteros, PhD



# **Artificial Intelligence: Teaching & Learning with AI**

An introductory guide for using AI in Education

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# Special thanks

for their valuable time in assisting in the development of this short  
guide with their suggestions:

Pola Mithou

## Main topics of this guide:

- A brief history of Artificial Intelligence
- Machine Learning
- AI for image creation
- AI programming



# About this guide:

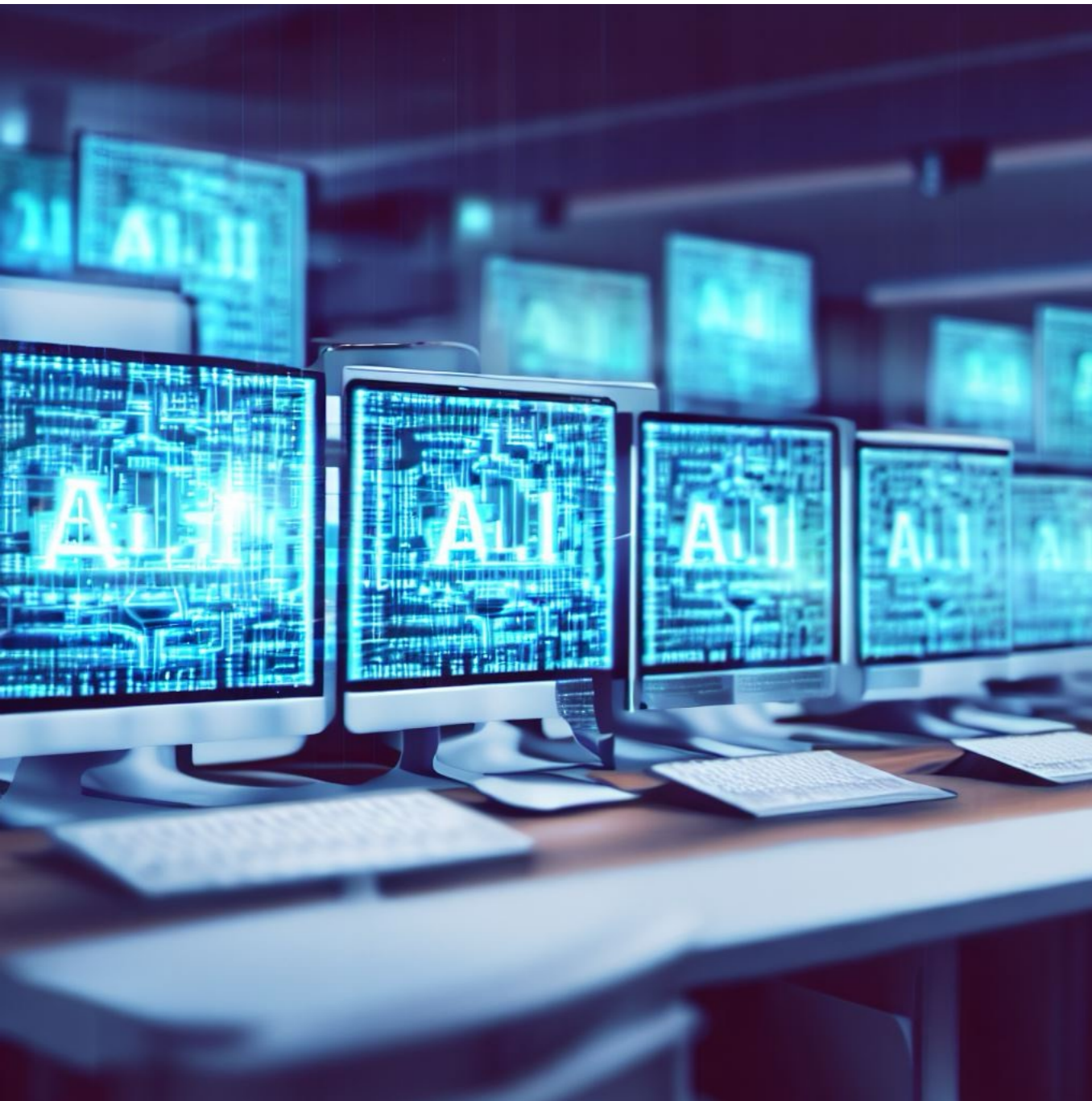
AI has made serious inroads in education, especially with the development of programming tools and technologies that allow even students of younger ages to use them effectively.

This guide is divided in two parts. In the first part, we provide a brief history of the the development of AI, starting with ancient myths and legends and moving forwards the current era of technological breakthroughs.

In the second part, we look at activities that can be used in the classroom, from primary to secondary education. Some are structured, interactive activities that enable students to learn more about AI and Machine Learning ([code.org](https://code.org)), others are open-ended and can be applied in various subjects of the curriculum (AI image generators) while others offer a chance to program an AI to recognise facial and hand gestures. Each chapter covers a different tool or set of activities, with lesson plans on how to use them in the classroom.

This guide could be extended to a book with more than 400+ in size. However, that is not the scope or intention but rather to give teachers wishing to use AI with their students a brief introduction. And then allow them to unleash their imagination!

# Welcome!



Welcome to my guide on AI in Education. This has been in development since April 2023 and the EU CodeWeek meeting in Brussels. That is when the idea of actually creating a short guide on AI came up, since there is rising interest in the subject from educators all over the world. With the development of various resources and technologies, all that was needed was a way of bringing (some of) these under one roof, with suggestions on how to use them effectively in the classroom. Of course, the activities on Machine Learning from the outstanding [code.org](https://code.org) portal already have amazing lesson plans, therefore no further information is required there. However, the rest of the chapters encompass all the activities in a way that attempt to enable learners a bird's eye view of different aspects of AI.

I hope you enjoy this guide as much as I did creating it! Feel free to share suggestions: [alexandros@mathisis.org](mailto:alexandros@mathisis.org)

# Part A: What's AI?



# Chapter 1. A brief history of AI



# In this chapter...

In **Chapter 1: "A brief history of AI"**, we will learn about:

- **AI Vs Robotics:** what is Artificial Intelligence, and why Robotics and AI are not the same.
- **Myths and legends about artificial life:** how mythology has given us the first examples of an artificial "life", and its implications in modern fiction.
- **The automatons:** an attempt to create artificial constructs that act as living human beings.
- **AI in Science Fiction:** how AI is depicted in the writings and movies / tv series.
- **AI in arts:** how Artificial Intelligence is used to generate graphics and what are its implications.

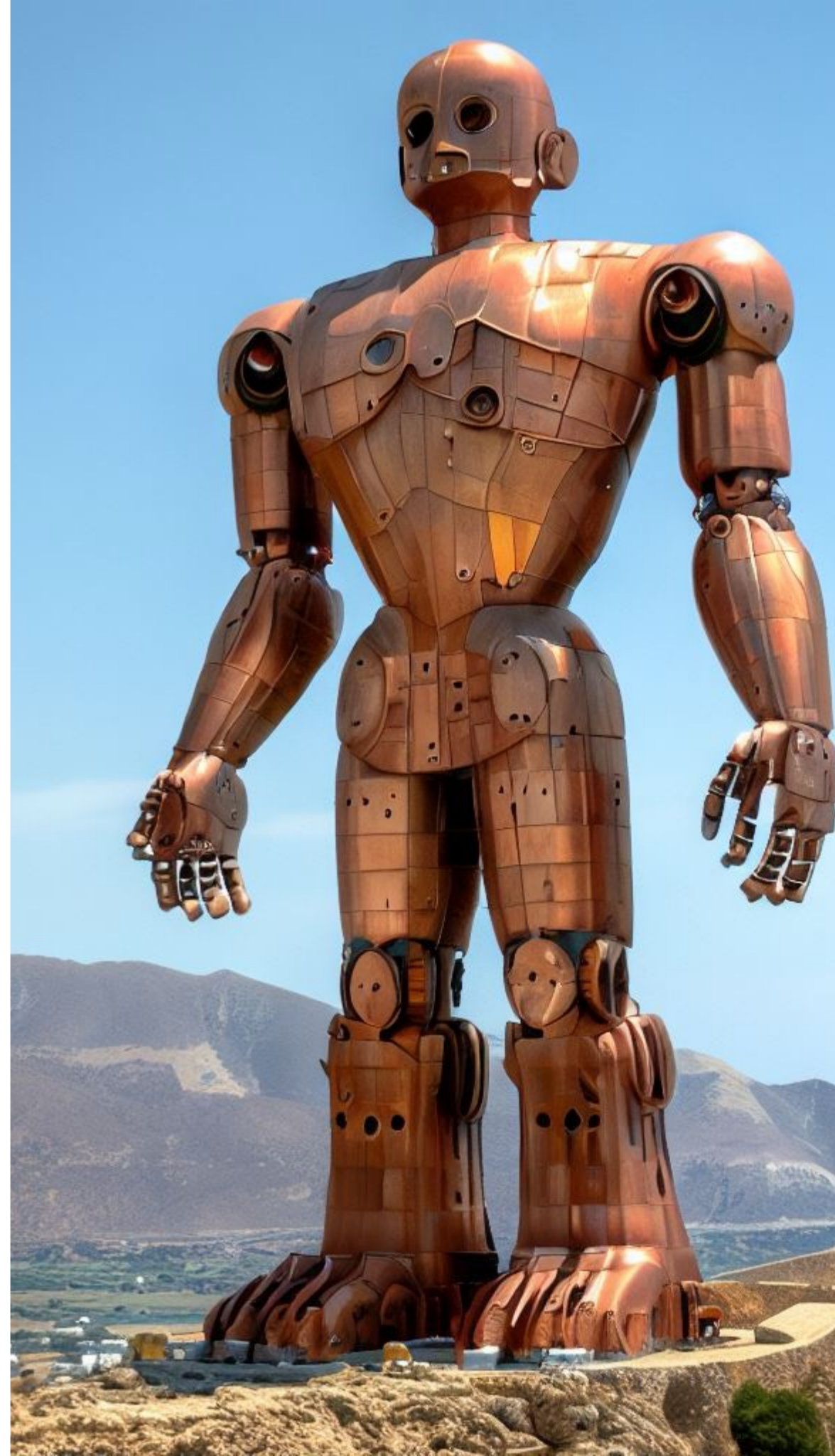


# A brief history of AI

Human kind has always loved the idea of creating sentient machines. To learn more about the history of AI, we need to delve into mythology and ancient history, in times where science was not yet prevalent and natural phenomena were attributed to the will of the Gods. From there on, we move forward through the ages and through various myths and legends, to admire the Automaton, before we reach the modern era of the 1940s and the advent of the first digital computers.

Between mythology and the digital age, we need to examine the impact of Science Fiction in helping us grow an interest to AI and their physical manifestations: that is, (almost) sentient robots. The film industry has introduced deadly robots (Forbidden Planet) as well as friendly ones (R2D2 and C3PO from Star Wars, Data from Star Trek).

The digital age saw an emergence of the field of AI with the development of intelligent systems, leading to the second decade of the 21st century and an explosion of new technologies that made AI mainstream.



# AI Vs Robotics

Science fiction has done its part in bringing together robots and AI. As a matter of fact, robots in science fiction novels, movies and TV series are always “intelligent”. However, robotics and AI are not necessarily the same. Even though the two fields are related, and in many aspects they seem complimentary, in truth they are completely distinctive with different applications and methods. The integration of AI and robotics has been an integral part of cinema since the early days of the science fiction era. For example, in “Forbidden Planet”, a 1956 movie, Robby the Robot has its own character and personality, clear indications of an advanced AI. Robby is a robot and can move around while at the same time exhibiting “intelligence”. Probably the most famous AI in movie history is HAL from 2001: A Space Odyssey. Contrary to the robotic nature of Robby the Robot, HAL is an AI integrated with the space ship, and able to recognise faces, gestures, speech and take its own decisions through

learning. As a conclusion, robots are machines designed to interact with the environment, including objects, and to perform specific tasks (ie lifting objects, soldering circuits etc).

An AI is a software system that can make decisions by analysing information from its environment (ie recognise a red light and stop a car, recognise the face of a person and unlock the computer etc) and even learn.

AI and Robotics are expected to merge as technologies and provide new products.



HAL 9000 from “2001: A Space Odyssey”

# Talos, the first(?) robot

Going back in time, the very first known example of an artificial intelligence was the legendary bronze warrior Talos, created by Hephaestus to guard the island of Crete. Hephaestus worked in his lab day and night with the help of a cyclops to create the ultimate guardian of the island, which he then offered to king Minos.

Talos was a giant “robot” or automaton, tasked with running around Crete three times a day and repelling invaders. The first depictions of Talos are dated to 400 BCE. According to a myth, Jason and the Argonauts reached Crete while returning from their voyage carrying the Golden Fleece.

Talos tried to sink their ship, Argo, by throwing huge boulders at it. Desperate, Jason turned to Medea who was a witch. Medea found the weakness of Talos, a huge nail keeping ichor, the liquid that kept him alive, inside its body. Jason managed to remove the nail, thus releasing ichor



and killing Talos. The death of Talos has been depicted in art over the years, helping spread the myth and the legend of the first artificial “life” in mythology.

## Ancient Egypt & China

The myth of Ptah (3000 BCE) suggests the creation of Osiris as an artificial being. Similarly, in ancient China there are myths regarding artificial persons. However, the myth of Talos is clearly describing an artificial life made of metal and powered by an “unknown” power source referred to as ichor.



# Automatons

Automatons or automata (the term is derived from the Greek word "αὐτόματα" which means "being able to operate on its own" refer to complex constructs that could mimic functions of living beings. For example, a cuckoo clock will open its doors and reveal a small bird that flaps its wings and makes noise to tell time.

There are many examples of automatons in the ancient times. Some of the best known were the machines of Heron of Alexandria, who used hydraulics to create automatic doors and other complex machinery, including music organs. Many cultures, including the Chinese and the Japanese, have created their own automatons (or automata). One notable example is the legend of Yan Shi, a creator of artificial beings that presented King Mu of Zhou with a mechanical person. Upon touching its artificial skin, the automaton started singing and moving. However, besides a reference in a text (Lie Zi, 400 BCE), there is no other evidence to support that such a machine was ever



created. Some of the most complex automatons were created during the 18th century. A set of automatons created by Jaquet-Droz are considered to be the most sophisticated ever created. The most complex was "The writer" which could write text on a piece of paper!

## The infamous Turk

A very sophisticated automaton was created in 1769. It could play chess and it even managed to defeat some important opponents, including Benjamin Franklin. However, even though it was a very complex mechanism, it proved to be a hoax, since it was found to be operated by a human inside the complex machine!



# AI in Science Fiction

Nothing has influenced the depiction of Artificial Intelligence more than (science) fiction. From the writings of Isaac Asimov and his Laws of Robotics, to HAL from "2001: A Space Odyssey" and the modern era of the latest "Terminator" movies, AI and intelligent machines are depicted either as malevolent or benevolent, depending on the writer and the setting. For example, in the dystopian future of "The Matrix", machines have rebelled and enslaved the human population which are actually used as batteries inside a virtual reality. In "Battlestar Galactica" (remake), machines have rebelled against their creators. In the film "AI", Earth has been left devastated and the only intelligent beings are actually artificial ones. AI seems to make a very good background story as the main antagonist, since it exonerates (in most cases) our kind for any fault they have.

On the other hand, we have benevolent machines, with the more prominent ones and most recognisable the droids



from Star Wars (R2D2, C3PO to name two). Interestingly enough, one of the main sci-fi TV shows and movie series -Star Trek- has barely touched the surface of benevolent or malevolent AI, with the exception of the bio-based Borg or Commander Data.

## The Laws of Robotics

Isaac Asimov, the famous science fiction writer, has written his three laws of robotics: 1. A robot may not injure a human or allow a human to be harmed, 2. A robot must obey orders except when they conflict with law 1 and 3. A robot must protect its existence as long as it does not conflict with laws 1 and 2.



# Chapter 2. Introduction to AI

# In this chapter...

In **chapter 2 "Introduction to AI"**, we learn about AI we already use (but we sometimes don't even realise we do!).

- Understand what Machine Learning is
- Recognise benefits of Virtual Assistants
- How AI "helps" us decide what to watch, read or buy
- How AI enables us to find places on a map, and do translations in various languages - including Klingon!





## 2. Machine Learning

A known meme that circulates around the internet claims that “people are hooked, while machines are learning”. This meme holds some truth, in the sense that machines are indeed “learning”, but not in the traditional way. Computers learn by processing (usually) huge amounts of data, focused on specific topics. In most cases, you might have participated (unknowingly) in such a process. Have you ever used, for example, an “innocent” application on your mobile phone that ages your picture? Have you ever asked yourself why that application was ever created and why it’s free? We are not claiming every free application does that, but some companies have (wisely) chosen to release products out in the open so that thousands, if not millions, use them on a daily basis to give data that the computer can then use to “learn”.

Machine learning does just that - we give data to the computer in large amounts and it uses those data to learn how to make decisions.



# “Hey Siri...”

Did you know that **virtual assistants** such as Siri, Alexa, Cortana (and more) use machine learning to continuously improve how to understand and communicate with you? Every time you use them, you are actually refining and teaching them -without knowing it- how to improve their own service.

This is in fact one of the examples of using machine learning within devices that we use almost daily - and mostly our mobile phones that are now an almost integral part of our life.



## Common AI Joke:

“Why are you whispering?”

“Because Siri is listening”

“I laughed, Siri laughed, the TV laughed, the washing machine laughed...”

Virtual assistants are not only tied to our mobile phones but can be found on various types of devices. For example, Alexa, the virtual assistant developed by Amazon, is

featured on a number of different products mainly developed for home automation tasks - that is, to control various parts of your home, turning it into a “smart” house. For example, you can ask Alexa to dim the lights or even control the TV (especially if you have subscribed to Amazon service). With Alexa you can even order things from Amazon (surprise, surprise!).

In general, virtual assistants are built into mobile devices or smart appliances. They respond to voice commands and usually they have a voice of their own (male, female, robot...).



# Movies, Music, Marketing ...

Have you noticed how even a simple search on the internet can (then) generate constant ads on specific topics? For example, if you do a search for a new mobile phone, you will most definitely start seeing ads about other mobile phones or related products (cases, peripherals) wherever you click - in search engines, in social media etc. This is because search engines use machine learning to analyse our search preferences, or our music and video habits, in order to promote products that appear to be in our liking - be it a tablet that we just researched for purchase or just out of interest, or even an apartment we are interested in renting.

In some cases this might appear to be intrusive and even a nuisance. And it is, in many respects. However, it is hard to dismiss the benefits for both the consumer and the product owner, since machine learning can help push to us products and items that are closer to our liking. It also offers us a glimpse on new products and new items that might otherwise have passed unnoticed.



## Movie recommendations

Netflix and other similar services use machine learning to analyse our preferences and thus promote content that is more to our liking. This way, not only we don't have to search an endless stream of new content, but it helps (the service) keep our interest, and thus remain their subscriber.



# Translations

Translation engines use machine learning to improve the quality of translation between one language and another. The most common of these translators are text based, and they usually support all major languages (and then some!). Google has one of the most robust and accurate translators, offering near-instant translation of almost any text we throw at it.

Some services (such as YouTube) use machine learning to automatically create subtitles for the videos uploaded. This is a very important feature as it provides access to many videos for people that would otherwise not understand the language. However, this feature is still not mature, with the exception of generating text in English directly from videos in the same language.

Other services such as Skype already have a beta version of automatic translation (in text) when two people with different languages have a video conference. Even though in its infancy, it shows the tremendous potential that will



allow two or more individuals who do not speak the same or a common language negotiate any type of deal.

As technology keeps churning out more powerful computers with less components.

## From Klingon to English

What was once just a part of a fictional universe, and the mechanism with which they explained how everyone speaks the same language (hint: the don't), is now becoming a reality. More and more technologies are released that allow for direct speech-to-text development.

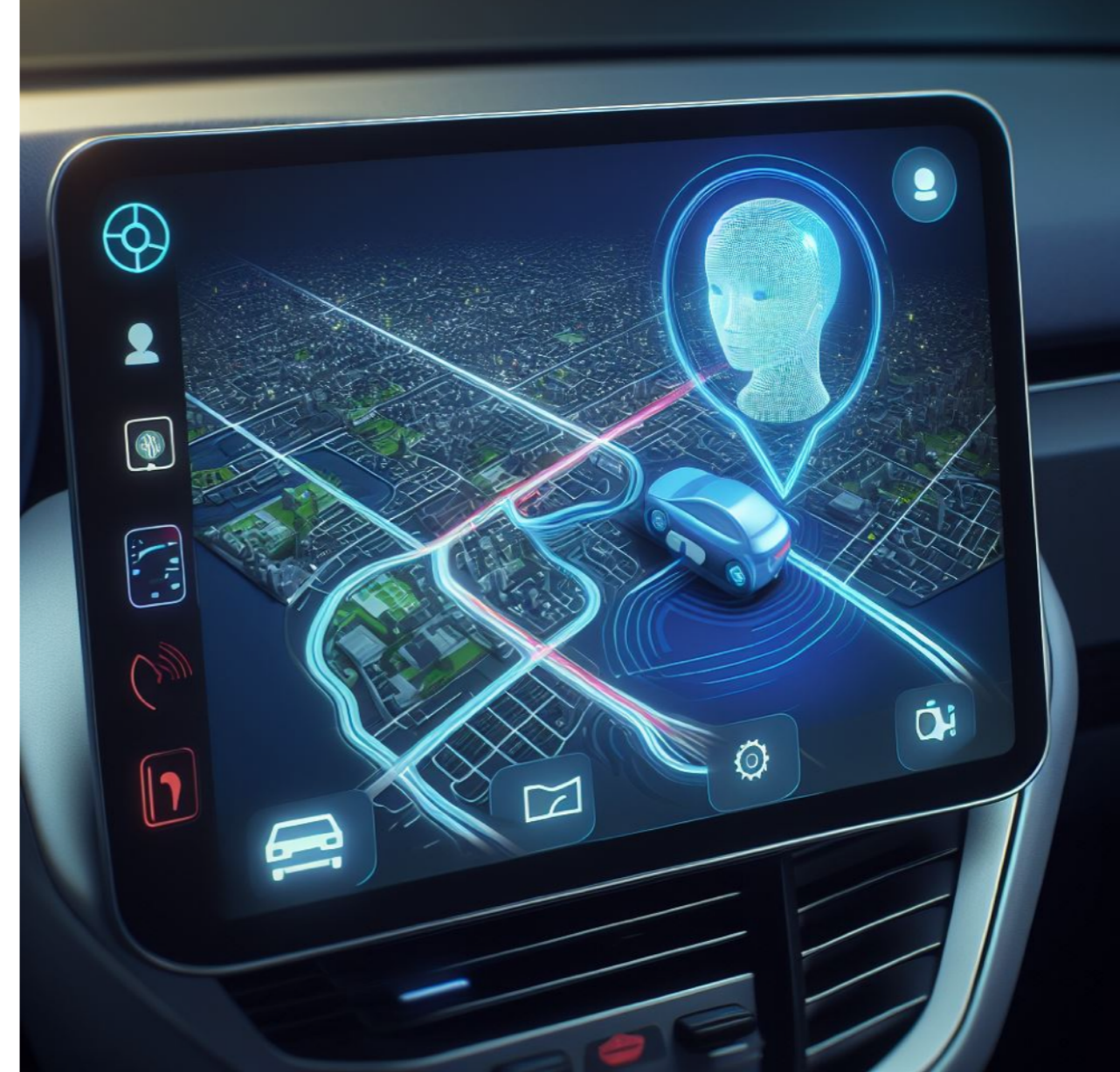


# Walking & Driving

Technologies such as Google Maps rely more and more on AI to provide drivers with optimum routes, as well as places of interest along a specific route. What initially was a vaguely detailed map of the world, has become more and more integrated with the Google search engine to provide on-the-spot information on anything the user might require, including search functions that learn from the driver, and thus propose interesting areas to visit.

The AI behind Google Maps is also using thousands of photos uploaded by the users to create virtual reconstructions of places of possible interest to drivers, in an effort to enhance both the use of the specific tool, as to make the driving experience more interesting (and useful). As such, the Maps application will provide the driver with suggestions on interesting or useful places to visit during a trip (ie of historical importance, EV charging stations, coffee shops for rest etc).

As drivers and Google Maps users keep providing large amounts of data to the application, the AI is constantly



improving the information it provides to the user (and drivers).

## AI in Google Maps

Google Maps uses literally thousands of photos to create virtual representations of spots on the map that might be of interest to us. Therefore, Google Maps uses an AI that falls under the “Computer Vision” category.



# Chapter 3: Intro to ChatGPT

# In this chapter...

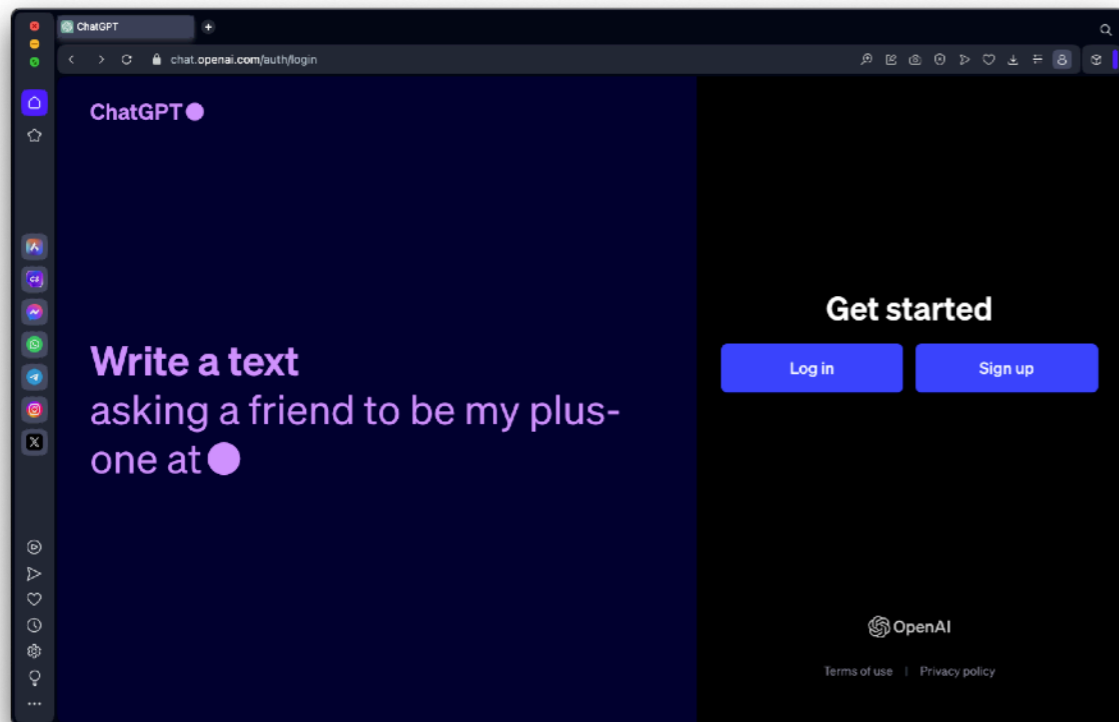
In **chapter 3 "Intro to ChatGPT"**, we are introduced to ChatGPT. We will:

- Learn more about the capabilities of ChatGPT and how to use it
- How ChatGPT compares to more "traditional" services such as Google Search and Google Translate
- How ChatGPT handles Mathematics
- How to use ChatGPT for creating code



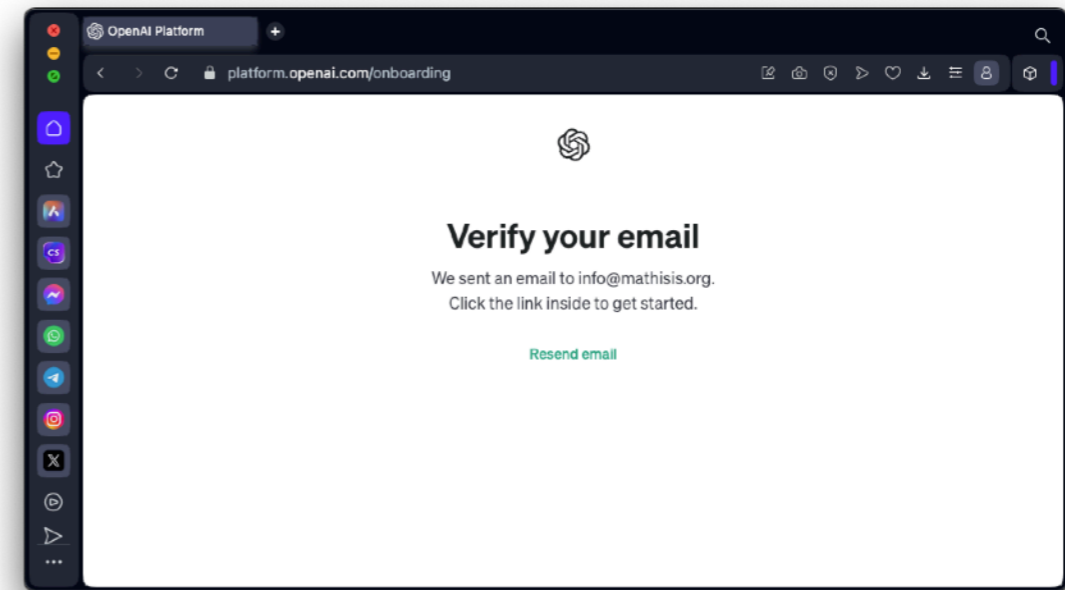
# Creating a ChatGPT account

ChatGPT from OpenAI is a jack-of-all-trades but it can be easily understood that it's also a master of several. For generating text, it is super-fast, multilingual and offers (almost) everything we need for writing. We will also examine, later in this chapter, other tools that are more specialised, but ChatGPT is THE tool for instant gratification.



For those unfamiliar with ChatGPT, please refer to Part A of this book. For those starting its use, you must first create an account, starting from the url <https://chat.openai.com>.

You can either create a new account, or link an existing one (ie from Google or Microsoft or Apple).

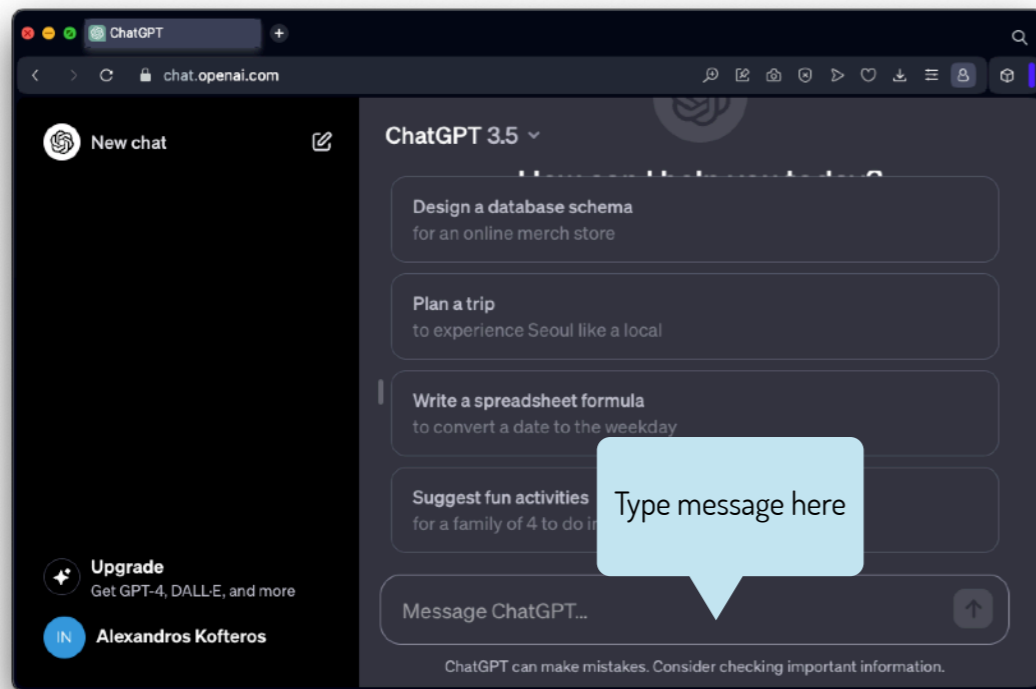


The creation of a new account is very straight-forward: you click Sign Up and then you enter your email and a password. An email will be sent to the account you provided (ie "[alexandros@mathisis.org](mailto:alexandros@mathisis.org)").

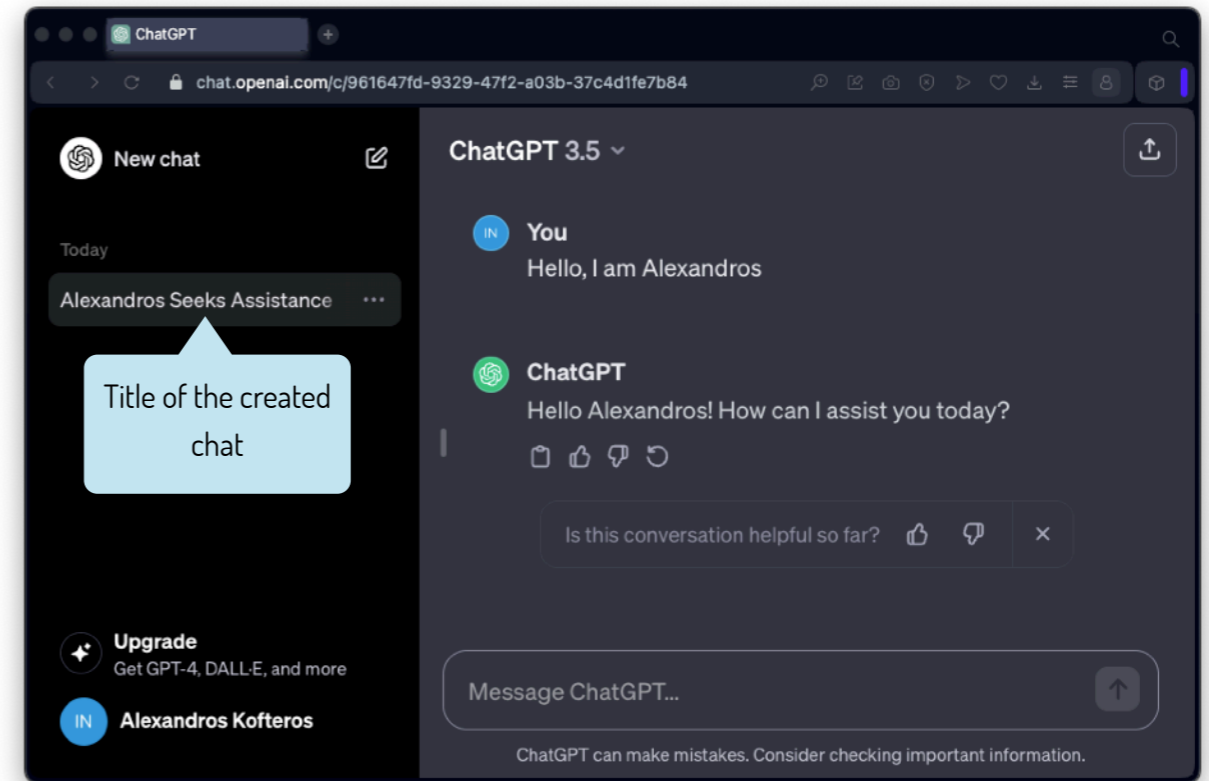
Login to your email account, find the email and just click on the green button "Verify email address". Another window will open, asking further details from you (full name and birth date). That's it! After you complete this step, you are ready to go!



# Starting with ChatGPT



The version we use in our examples is ChatGPT 3.5, and it's free for personal use. However, it does not mean it lacks any features we need for text creation. First up, let's familiarise ourselves with the extremely simple environment: on the left side of the window, we can keep a history of previous "chats". In the lower right part of the window, we can see the text box where we write simple sentences or full text. Let's start by introducing ourselves: we will just type "Hello, I am Alexandros" and hit the Enter key. Let's look at the response:



On the left part of the window, ChatGPT has created a title for our first "chat". Also, it has replied to our first sentence. It assumes immediately that we need some assistance and possibly a question will arise OR it prompts us to write a question.

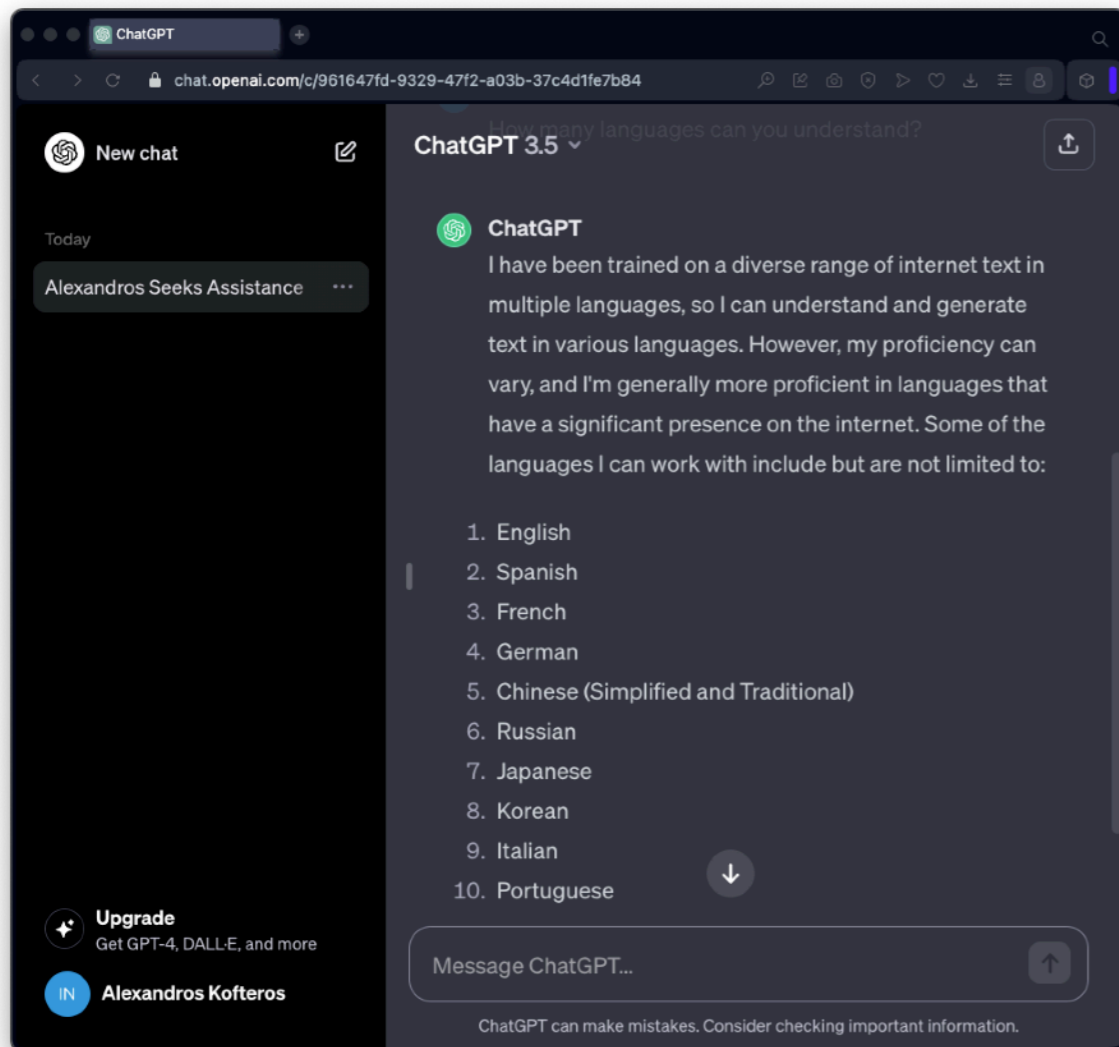
## Teaching the machine...

ChatGPT learns constantly by analysing the data and feedback it receives from us. As you can see on the picture above, under each reply we have the option of clicking on the "like", "dislike" icons or on the reload, to issue another response. We can also "vote" on how the conversation is progressing. These details might appear trivial but are essential in the constant improvement of every type of AI.

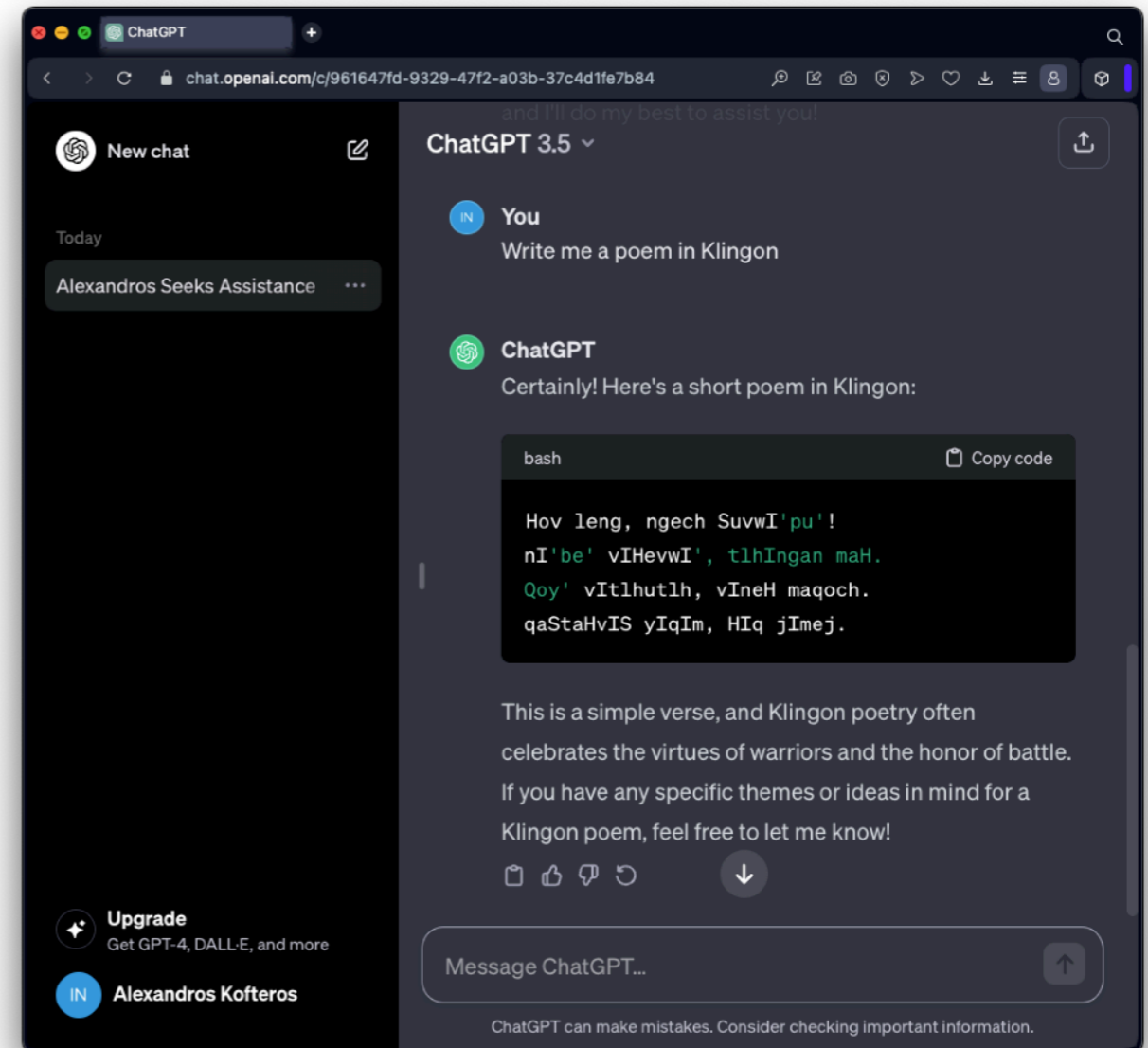


# Multilingual support

One of the main benefits of our chat is the support of multiple languages. As you can see on the screen, it can recognise -and respond in kind- to almost any language we can use. Not surprisingly, it can also tell us how many languages it can understand!



languages. However, it can respond in other languages as well, including Greek, Turkish and Klingon!



## Why Klingon?

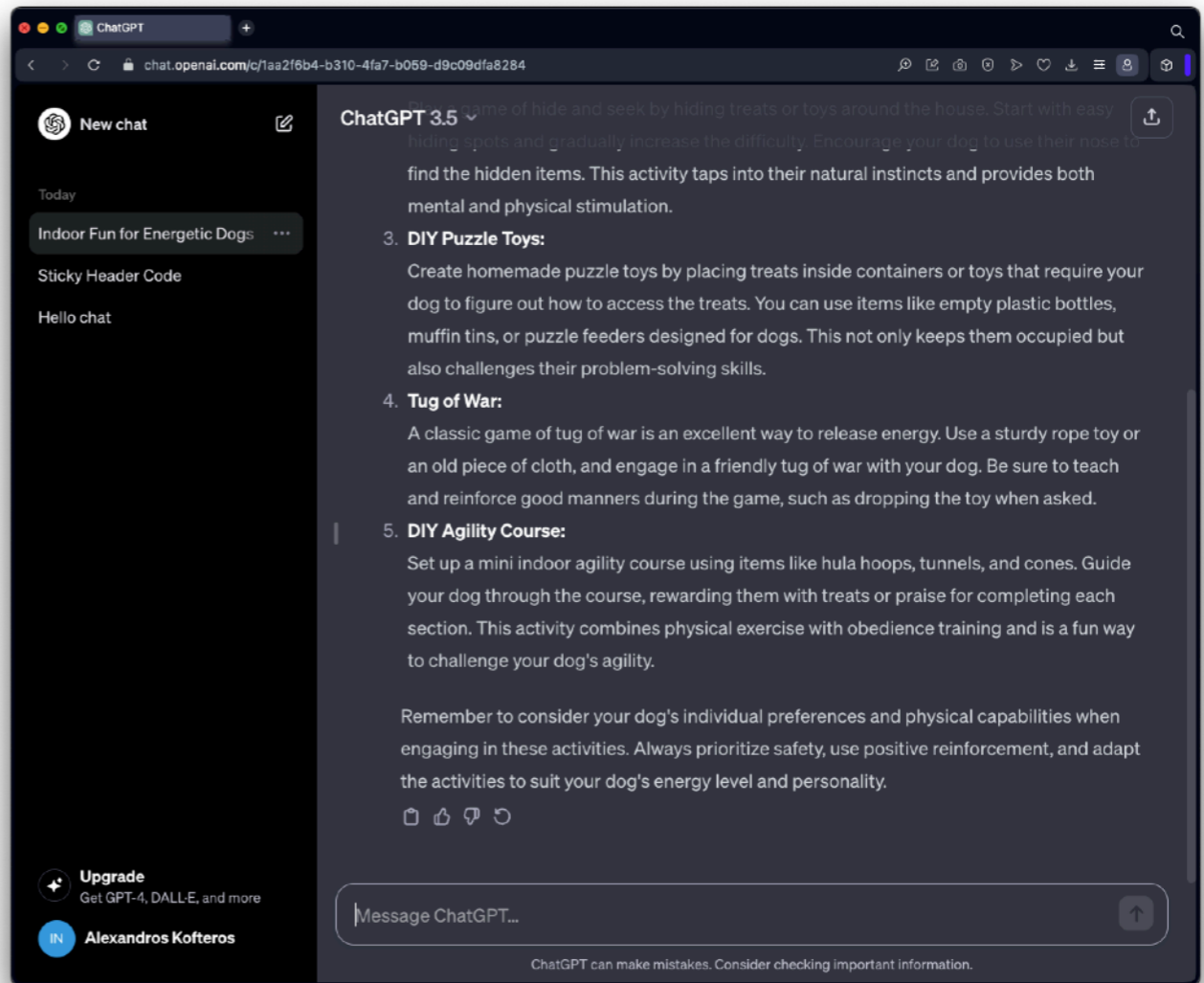
Even though Klingon is an imaginary language (it exists in the sci-fi universe of "Star Trek"), over the past 6 decades many people, including professional linguists, have created the structure of it, as if it was a real language. Therefore, ChatGPT has also learned to use it, however efficiently compared to real languages spoken by millions!



Because it learns through "crunching" huge amounts of data, it is much more suited to answer in English than other

# Working with chats

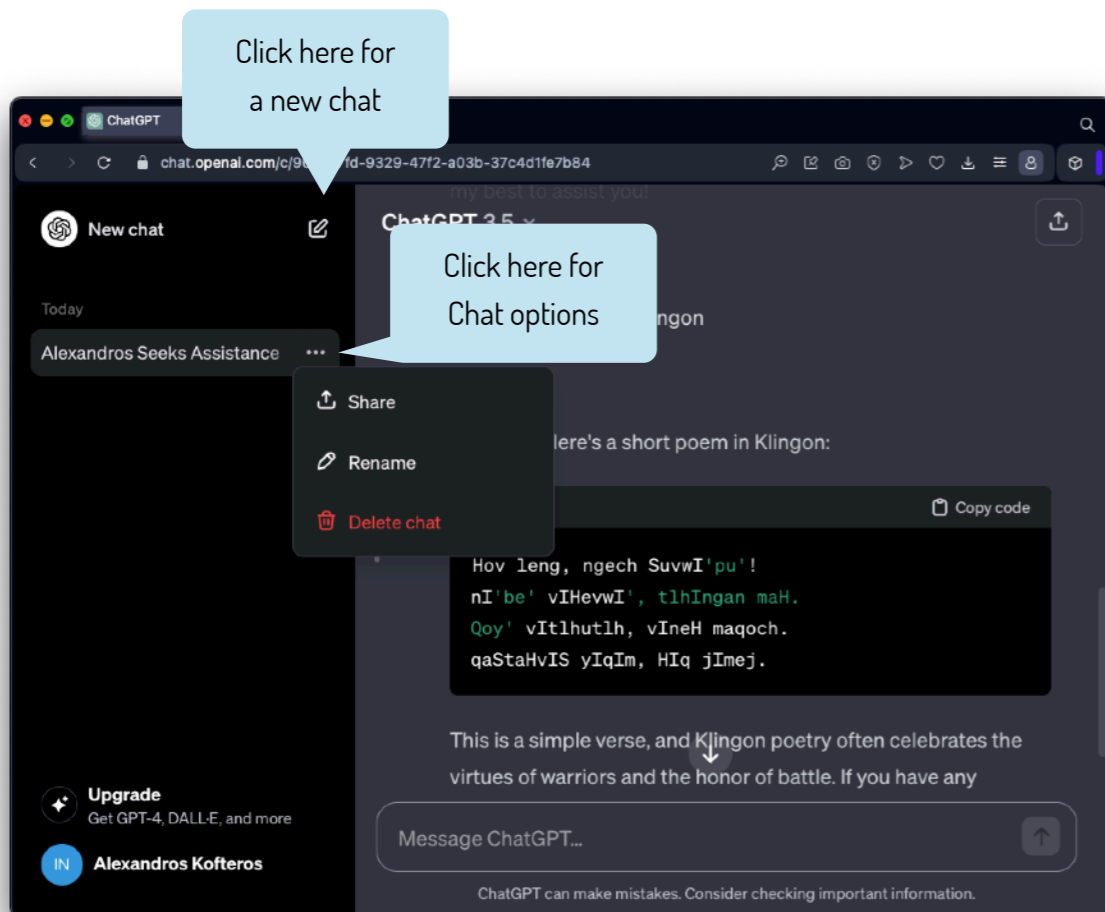
As we continue writing messages, all the replies and text produced are considered part of the same “chat”. However, during the day it is useful to create new “chats” for different type of replies and content creation. For example, during the same day we might require ChatGPT to create a text on a famous painter, and later on to create activities for our next Maths lesson. By keeping each type of reply in a different “chat”, we can more easily come back later to specific content.



Chats are very effective in organising our engagement with the AI and creating different types of replies and data.

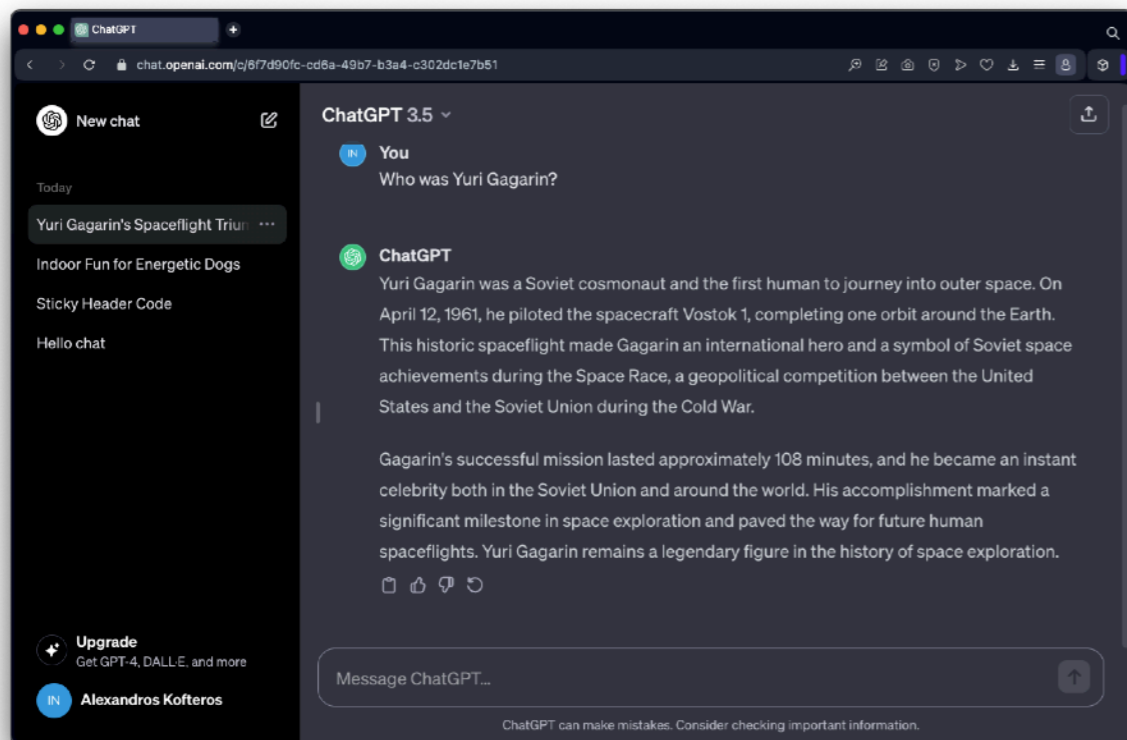
## ChatGPT for information search

ChatGPT can answer to most questions we wish to ask. It must be taken into account that not all of this information might be accurate, therefore we need to keep this in mind when using any of the replies generated by ChatGPT. We will see more on search using ChatGPT in the next pages.

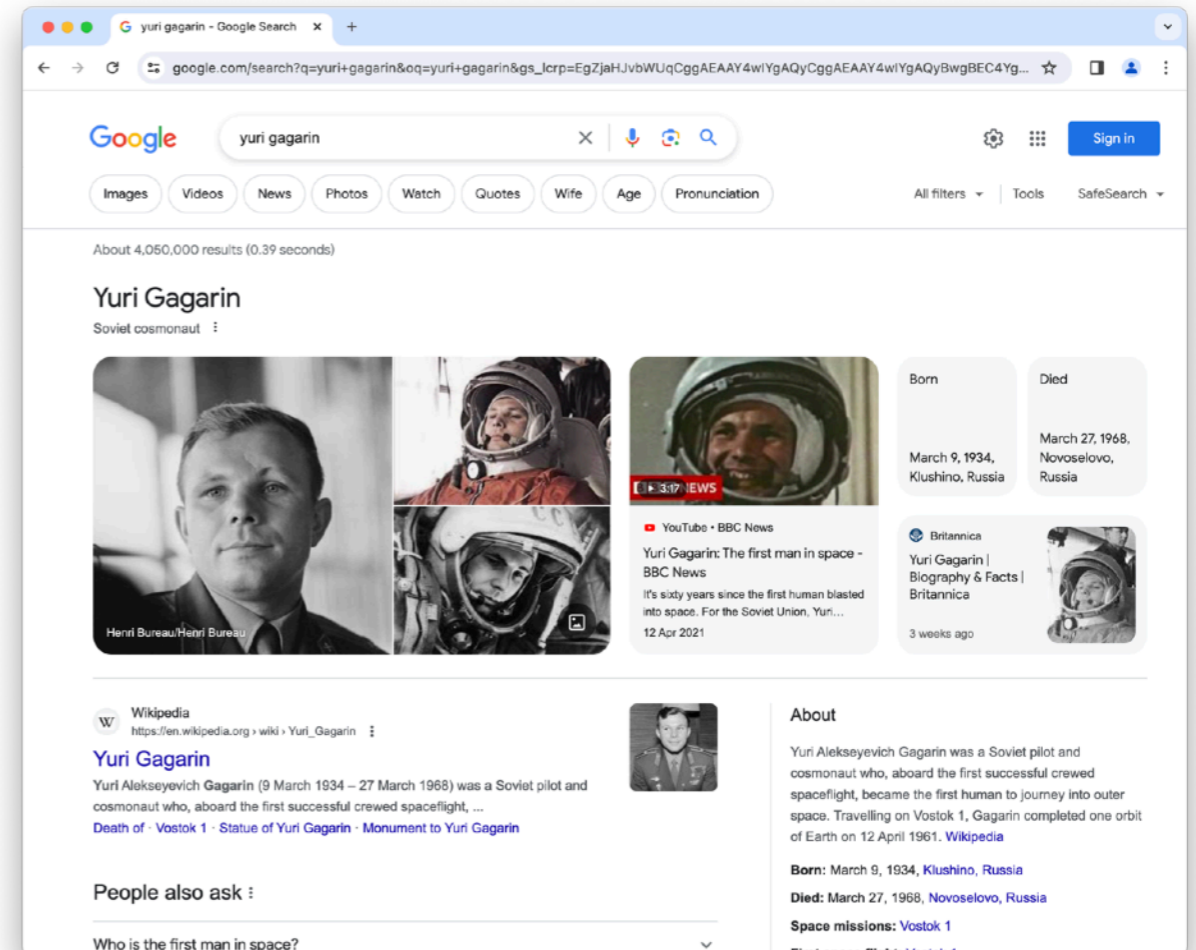


# ChatGPT Vs Search Engines

We have already established that ChatGPT can be used to return information on specific topics. However, this is far from using a dedicated search engine such as Google or Bing. Whereas in ChatGPT we receive a reply similar to what a knowledgeable person might give us (on a specific subject), search engines will return a list of web pages related to our question. And where ChatGPT gives an instant “answer” to the question, search engines might provide alternative -and equally significant- web pages that might provide us with the information we seek. And, in most cases, identify the source and therefore decide to trust the information or not.

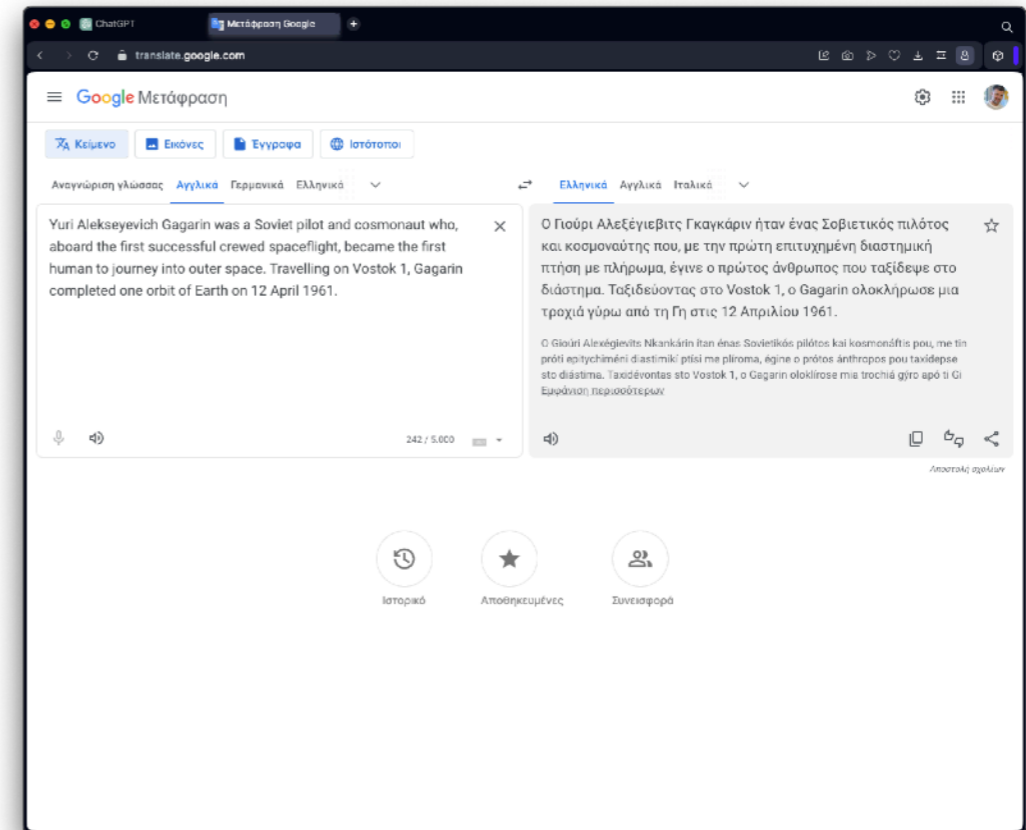
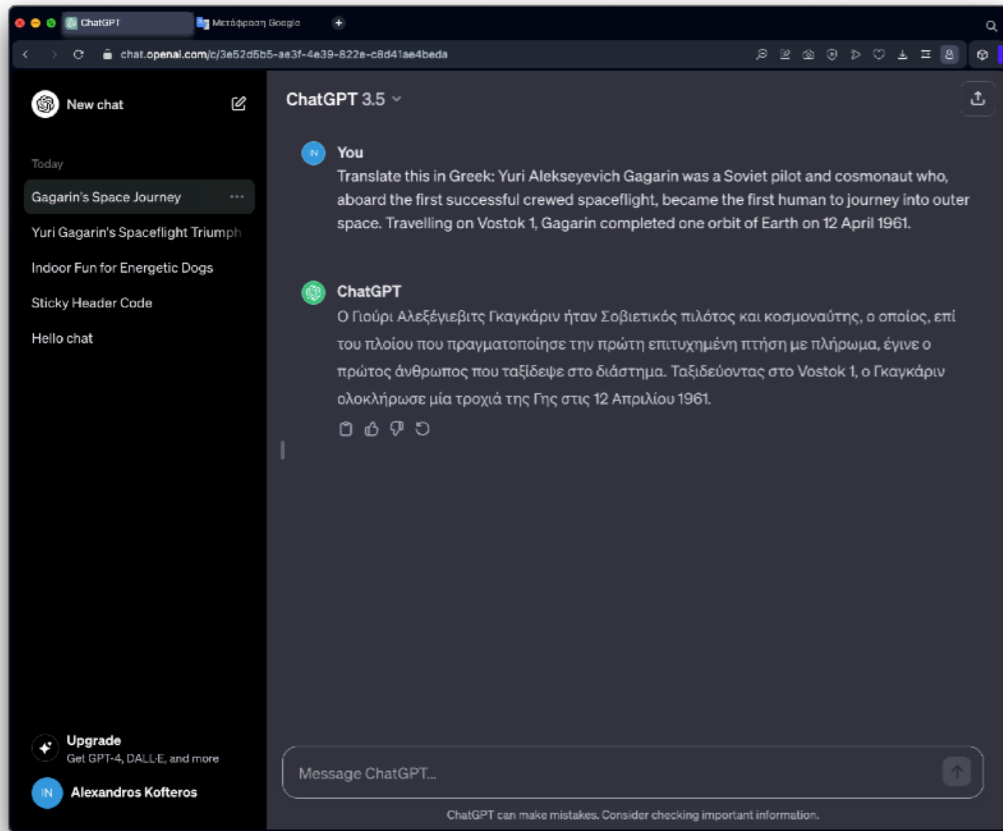


In ChatGPT, we get a precise text with information on Yuri Gagarin. On a search engine search, we get much more than that - we have a summary of his life, images, links to videos and links to multiple pages, including Wikipedia articles.



Generally speaking, if we need to search and receive as much information on a subject, we use a search engine. If we are looking for specific information focused on a search query, we can use ChatGPT. But, we should never take its results at face value.

# ChatGPT for translations



language to the other. ChatGPT is very capable in handling translations, but in most cases Google Translate -at least at this point- will do a much better job. On the window (left), we see a translation in Greek of the short bio of Yuri Gagarin. The translation by ChatGPT is full of mistakes that make no sense, whereas the Google Translate results (image top) are very good (with minor adjustments). query, we can use ChatGPT. But, we should never take its results at face value.

We can, of course, "ask" ChatGPT to retry the translation (which brings improved, but not much better results).

ChatGPT can recognise a vast number of languages, and reply (almost) perfectly in most of them. However, should we use it for translations instead of dedicated tools such as Google Translate?

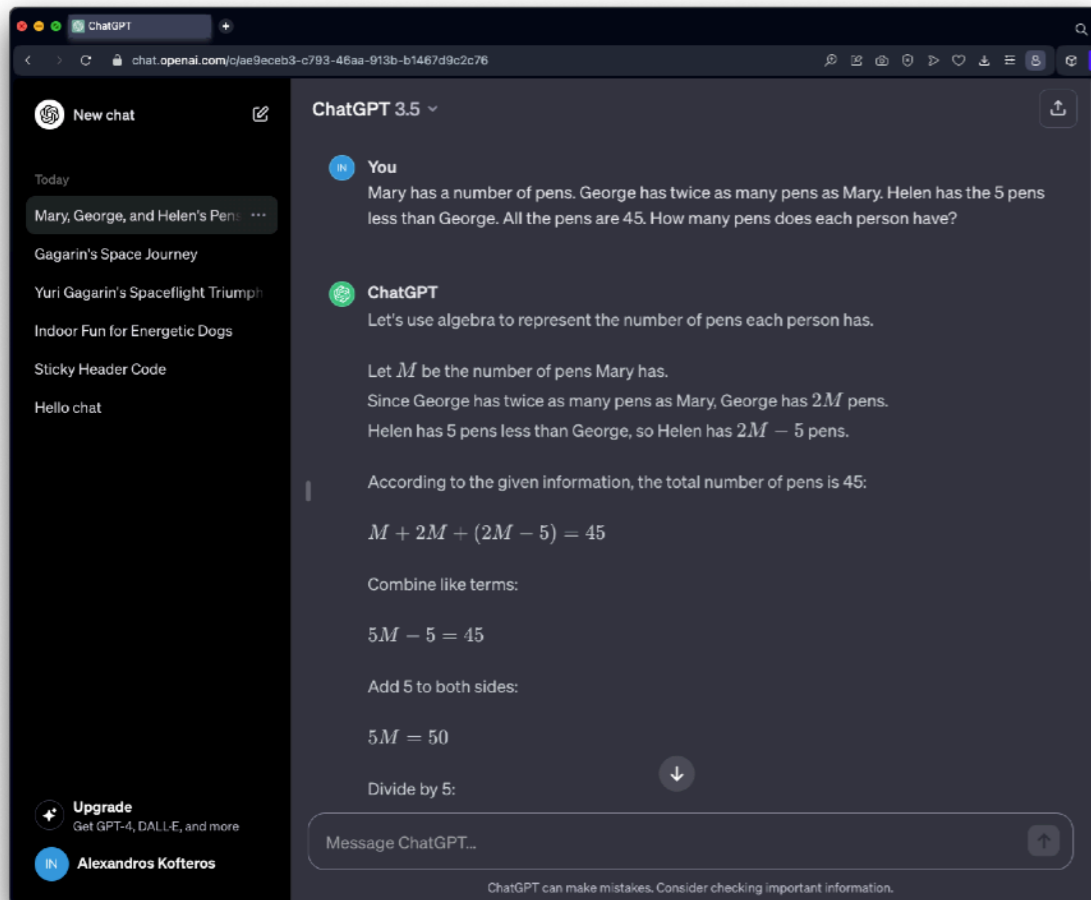
We should keep in mind that Google uses AI technology to constantly improve its translations. Therefore, dedicated tools such as Google Translate already use AI when translating a piece of text (or even a word) from one

# ChatGPT for Maths

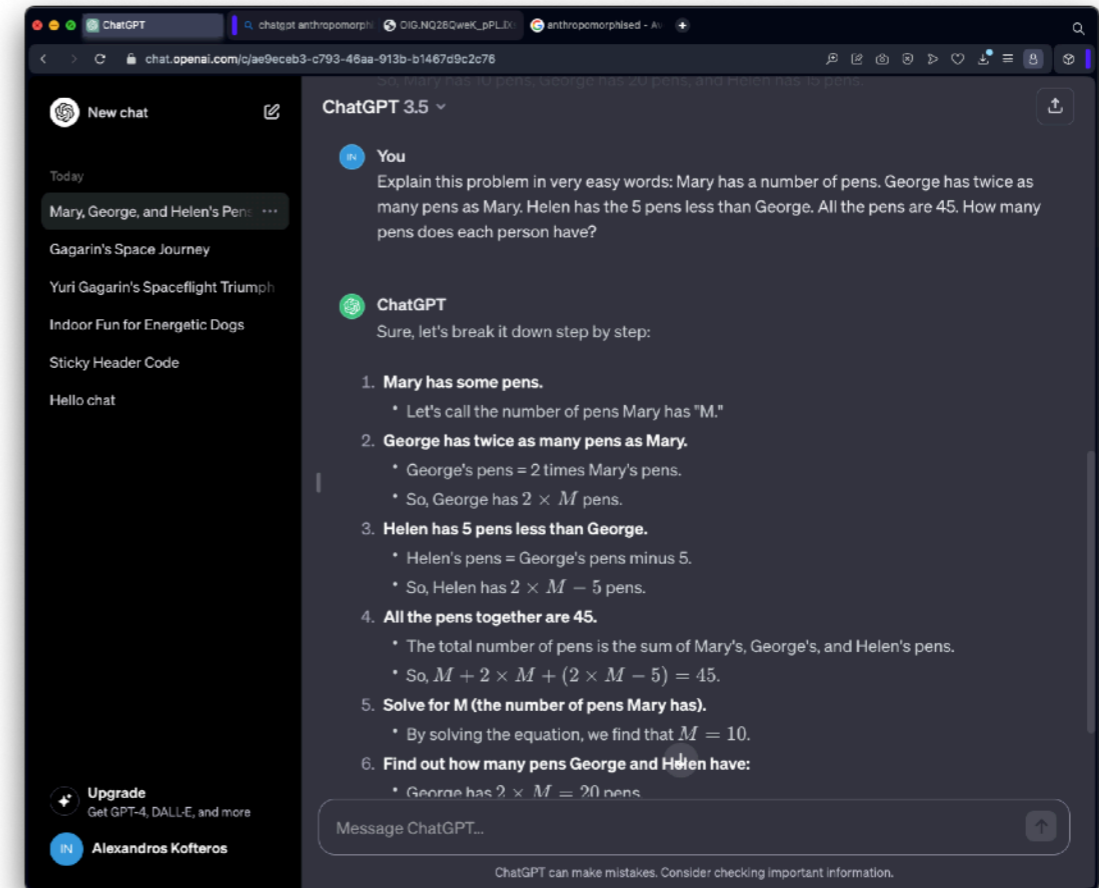
We can use ChatGPT to solve maths problems. No, we are not going to use it to solve problems that might require significant resources (ie “calculate the Nth Prime number”) but rather use it for simpler problem solving tasks.

Let’s take a typical problem:

“Mary has a number of pens. George has twice as many pens as Mary. Helen has 5 pens less than George. All the pens are 45. How many pens each person has?”



Maybe the way ChatGPT replied was not that simple and we might have trouble understanding it. We can ask ChatGPT to explain it again in simpler terms:



The picture above shows how ChatGPT broke the explanation in more steps, numbering each step and emphasising it using bold, white(r) headings.

In the next chapter, we will take this approach many steps further!

# **Part B: Hitchhiker's Guide to the Galaxy of Education**

# What's to learn

In Part B, we focus on practical uses of AI in education. We focus on tools that enable the integration of AI for preparatory teacher work (Worksheets, presentations, image creation) and will detail the pros and cons of each tool presented. Since there is an abundance of tools, we understand that it is impossible to cover each and every one. Therefore, we focus on specific tools that enable teachers to complete time-consuming preparatory tasks.





# Chapter 4: ChatGPT for Maths

# In this chapter...

In **chapter 4 "ChatGPT for Maths"**, we take a more in-depth look on how to use ChatGPT to prepare material for teaching Maths. We will:

- Create variants of problems using ChatGPT
- Generate solutions for maths problems
- Create explanatory instructions
- Create lesson plans
- Solve equations
- Create worksheets

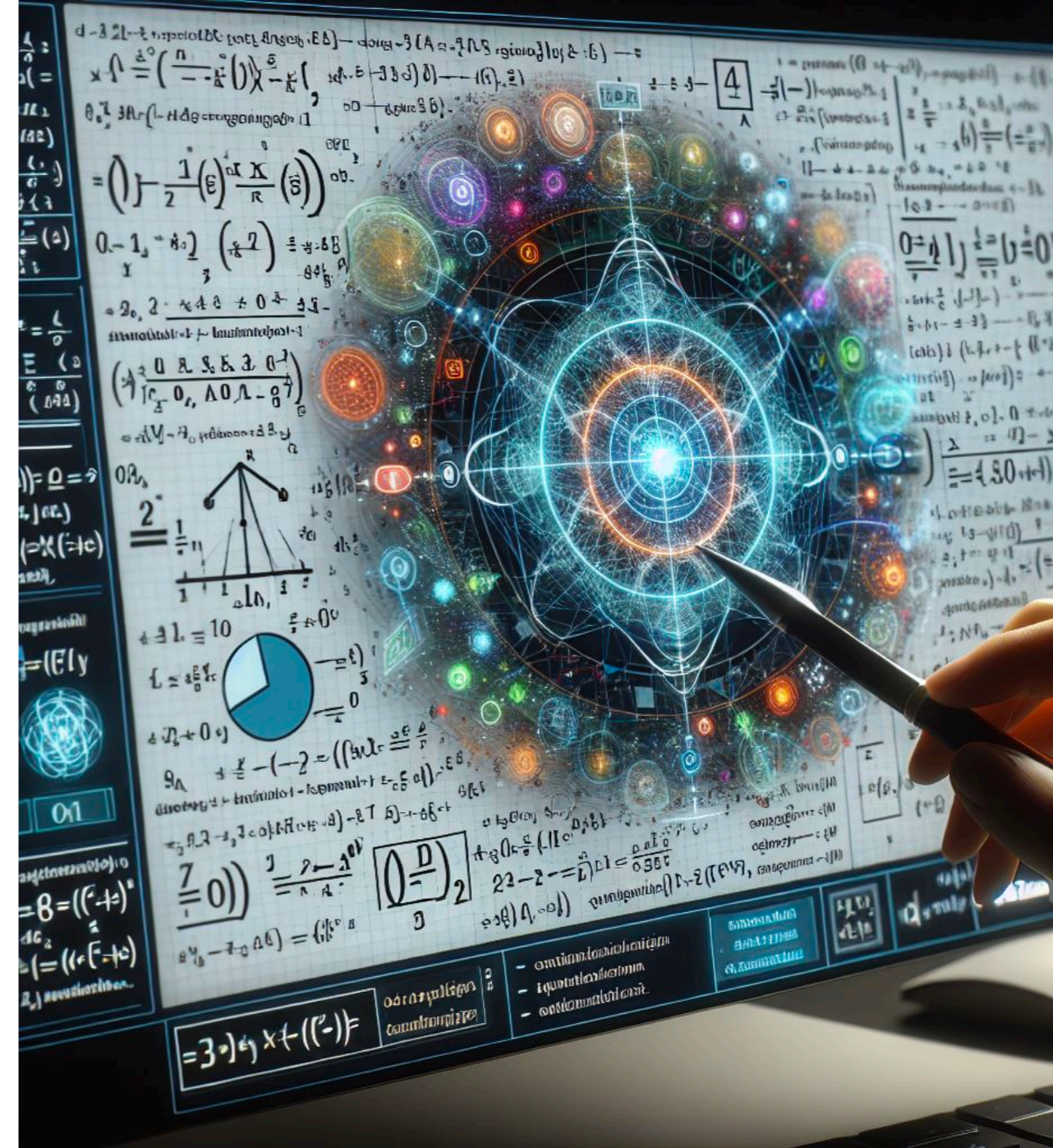


# AI for Maths

Maths... love 'em or hate 'em, they are -in many countries- what is called 'a core subject'. And even the most experienced teacher would like to be able to offer a variety of different material to his or her students, instead of relying on the same old, tried and tested, worksheets, instructions and material created over the years or found off the internet.

ChatGPT can enable experienced -or even less experienced- teachers to create innovative variants of their existing work, and also to cut down on time required to prepare new lessons and new activities.

Over the next few pages we will use ChatGPT to create such material and examine the pros and cons of using it to generate content. We will also focus on how to improve results from our instructions, to enable the delivery of the best possible generated outcome.



## ChatGPT & Tutoring

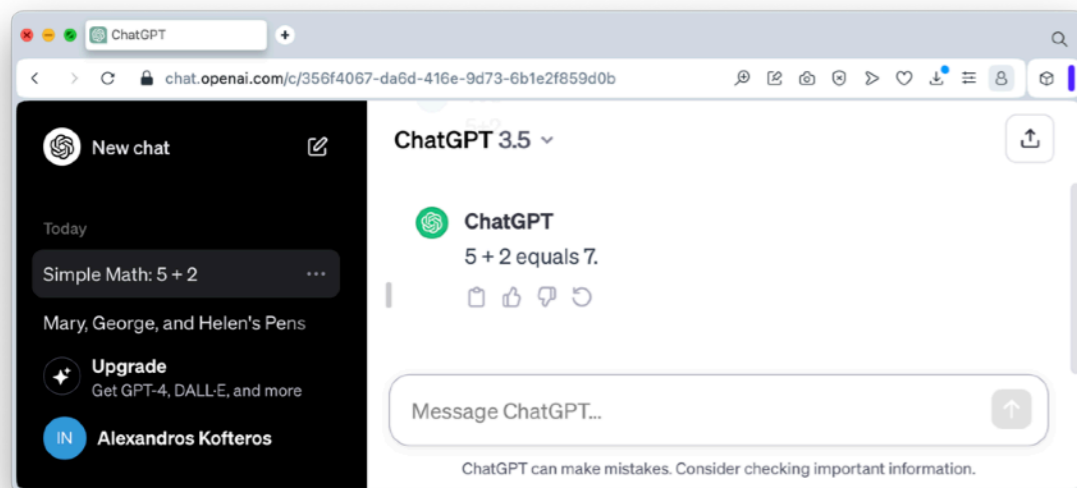
ChatGPT offers amazing capabilities for explaining complex problems. However, If a child exhibits significant learning difficulties, then the teacher will have to rely on his or her experience to provide the best possible assistance, tailored to the needs of the child.



# ...simple mathematics

ChatGPT is a real powerhouse when it comes to mathematics. As we have briefly experienced in the previous chapter, it can easily explain how to solve problems. But it can do much more than that, from the simplest task to the most mundane we can think of. For example:

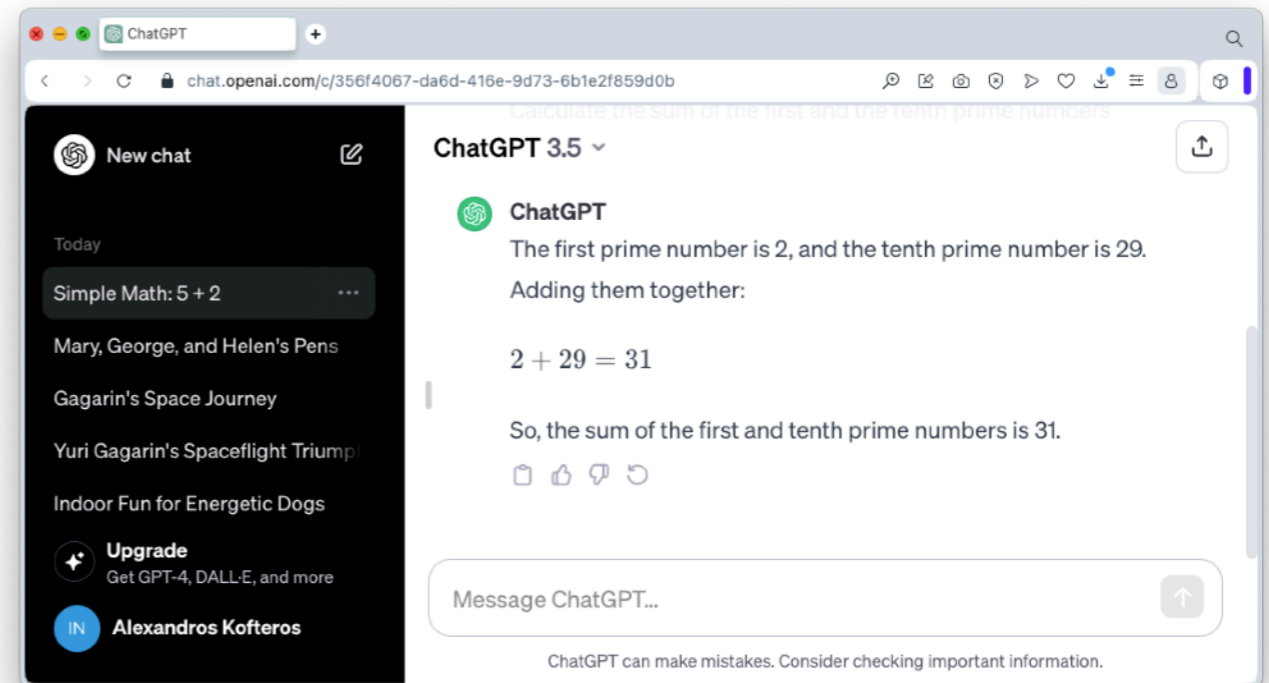
“5+2”



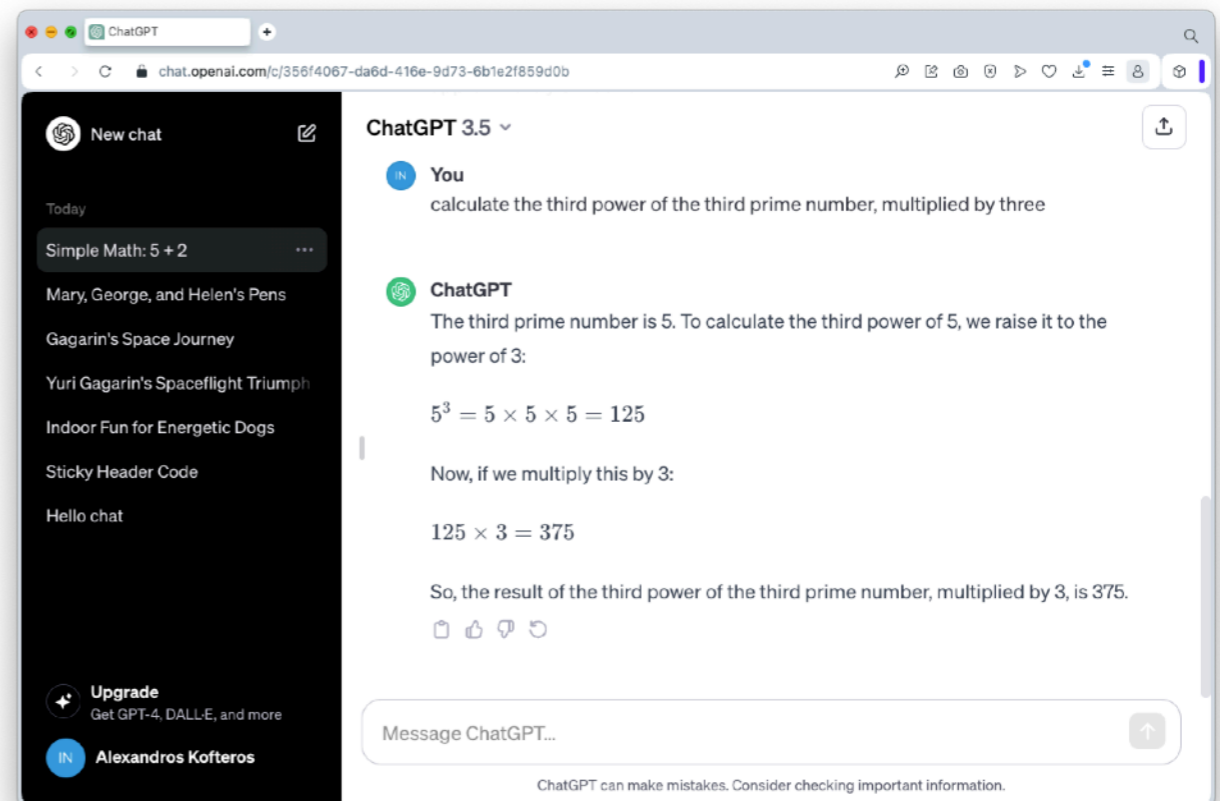
Very politely, it calculates the sum of 5 and 2. Similarly, it can solve much more complex calculations than the above, and even explain us how it did it.

Let us try again, but with prime numbers:

“Calculate the sum of the first and the tenth prime numbers”



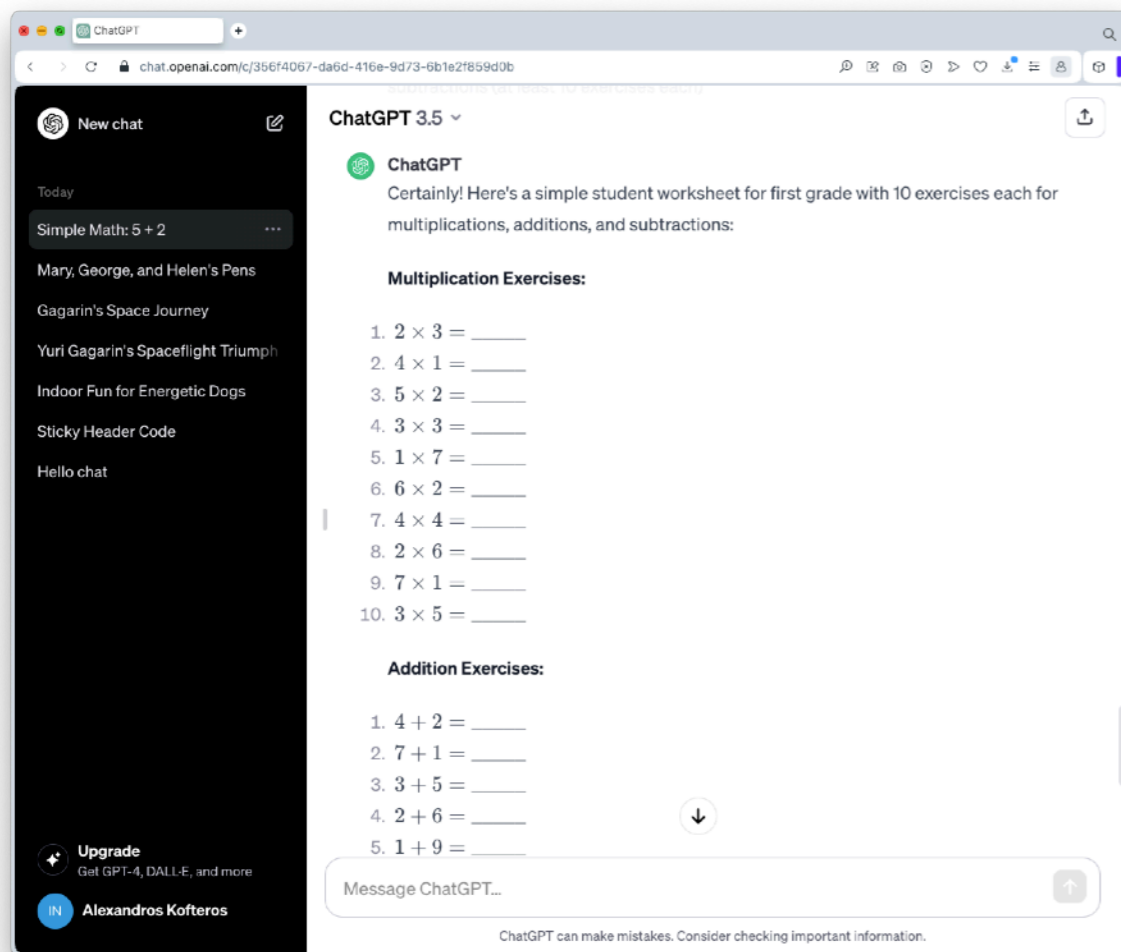
Not only it has solved the equation, but it also explains, step by step, the entire procedure. And, of course, we can continue with even more complex instructions.



# ...just worksheets!

Anyone who teaches mathematics really gets bored with having to create different worksheets for practice (and yes, we need practice...). But, just a simple command in ChatGPT can generate as many exercises as we need:

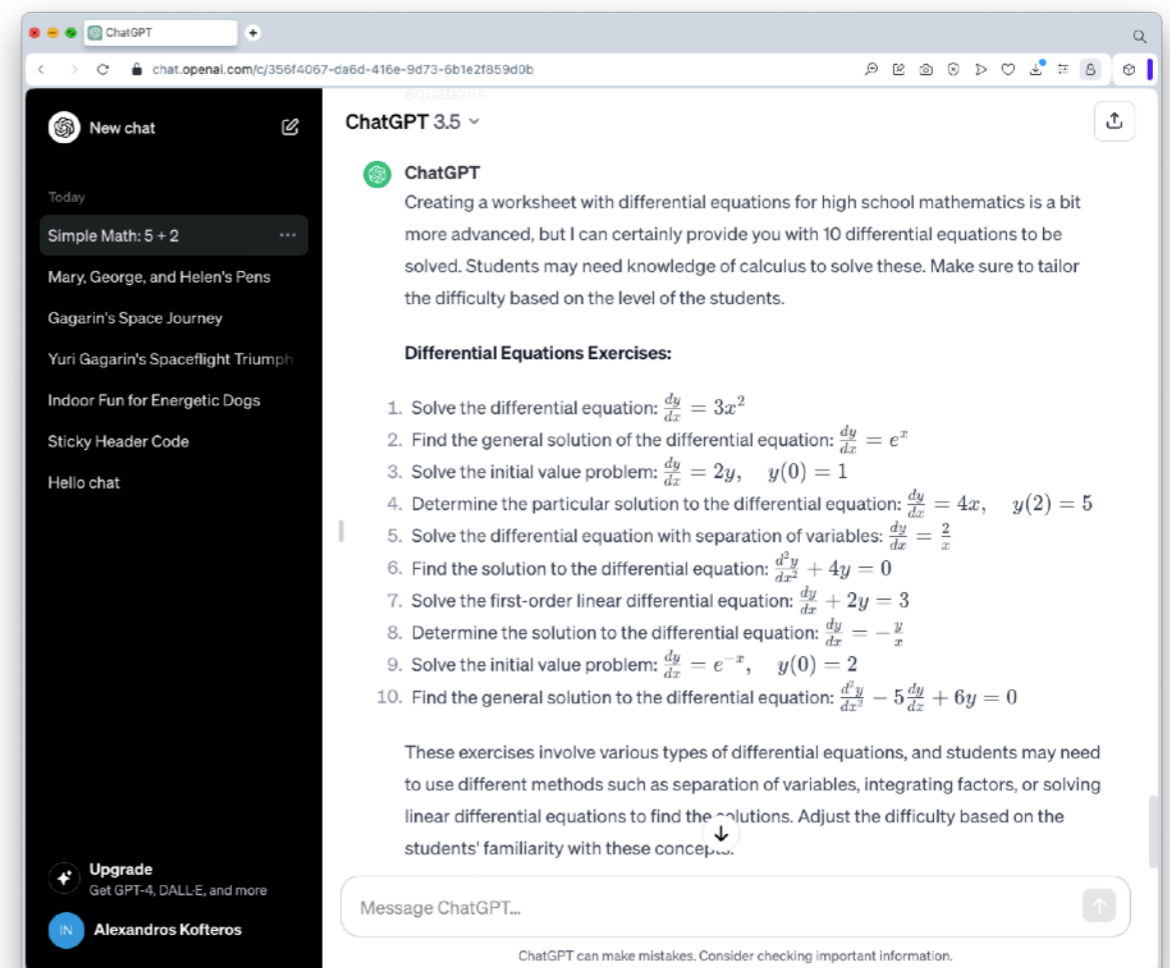
“Create a student worksheet for first grade, with simple multiplications, additions and subtractions (at least 10 each)”



We can copy and paste the above in a word-processing document, and provide all the necessary changes or customisations. We can even generate images from another AI-powered application (such as DAL-E) to enrich our worksheets with images!

Of course, we are not confined with primary school-level worksheets:

“Generate a student worksheet for high school mathematics with 10 differential equations”

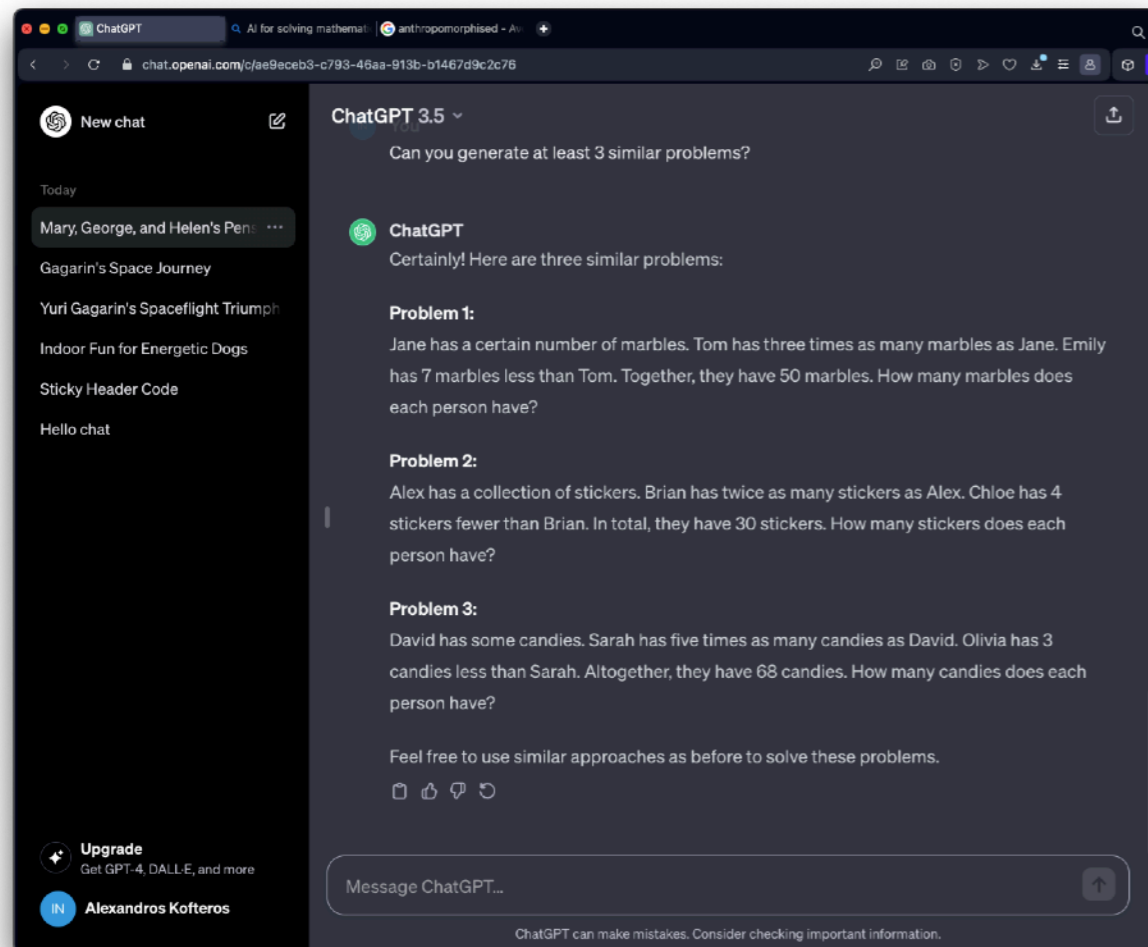


# Creating Maths problems

In the previous chapter, we asked ChatGPT to explain (and solve) the following problem:

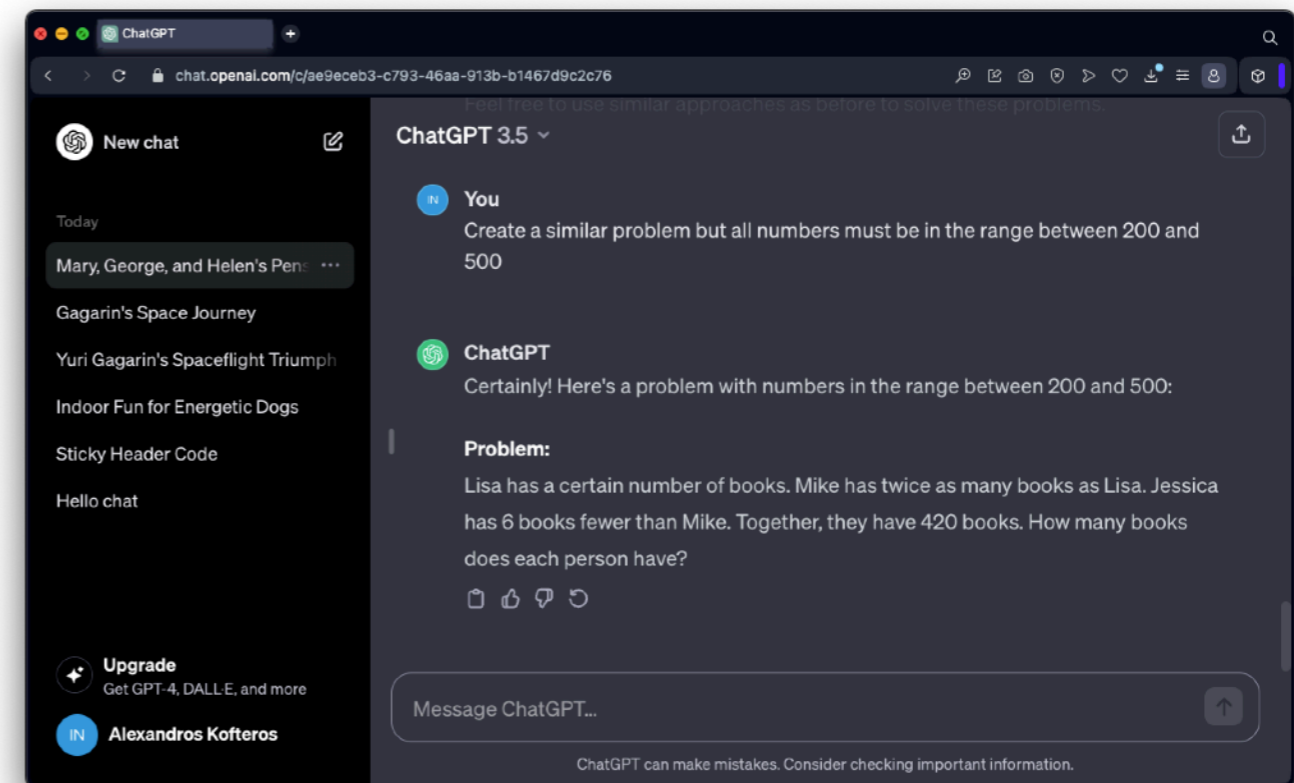
“Mary has a number of pens. George has twice as many pens as Mary. Helen has 5 pens less than George. All the pens are 45. How many pens each person has?”

ChatGPT can do more than that: it can use the text of a problem to create (almost) infinite variants! So, we (kindly) ask ChatGPT to generate 3 similar problems:



This is an amazing capability, since it significantly reduces the amount of time that is required for a teacher to write problems of a specific type.

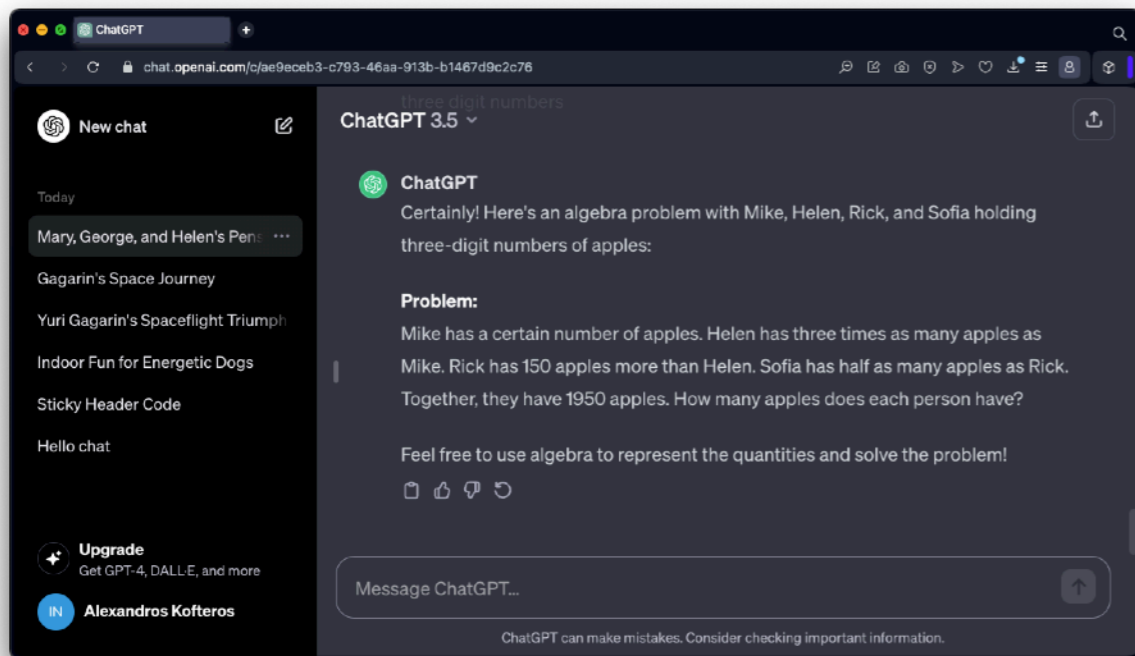
Of course, we can change the parameters of the problem and define more elaborate (or more specific) problems. For example, we might ask ChatGPT all the numbers to be between 200 - 500:



Even though Jessica has 6 books fewer than Mike, the number of books for each person is in the 3-digits range.

In the previous page, we used a specific problem to create variants. Let's just give some names and numbers to ChatGPT and see what it can generate:

“Create an algebra problem with Mike, Helen, Rick and Sofia, all holding apples, with three digit numbers”



Not surprisingly, ChatGPT has created a problem with the above simple instruction. Now, let's try to make it a bit more vague:

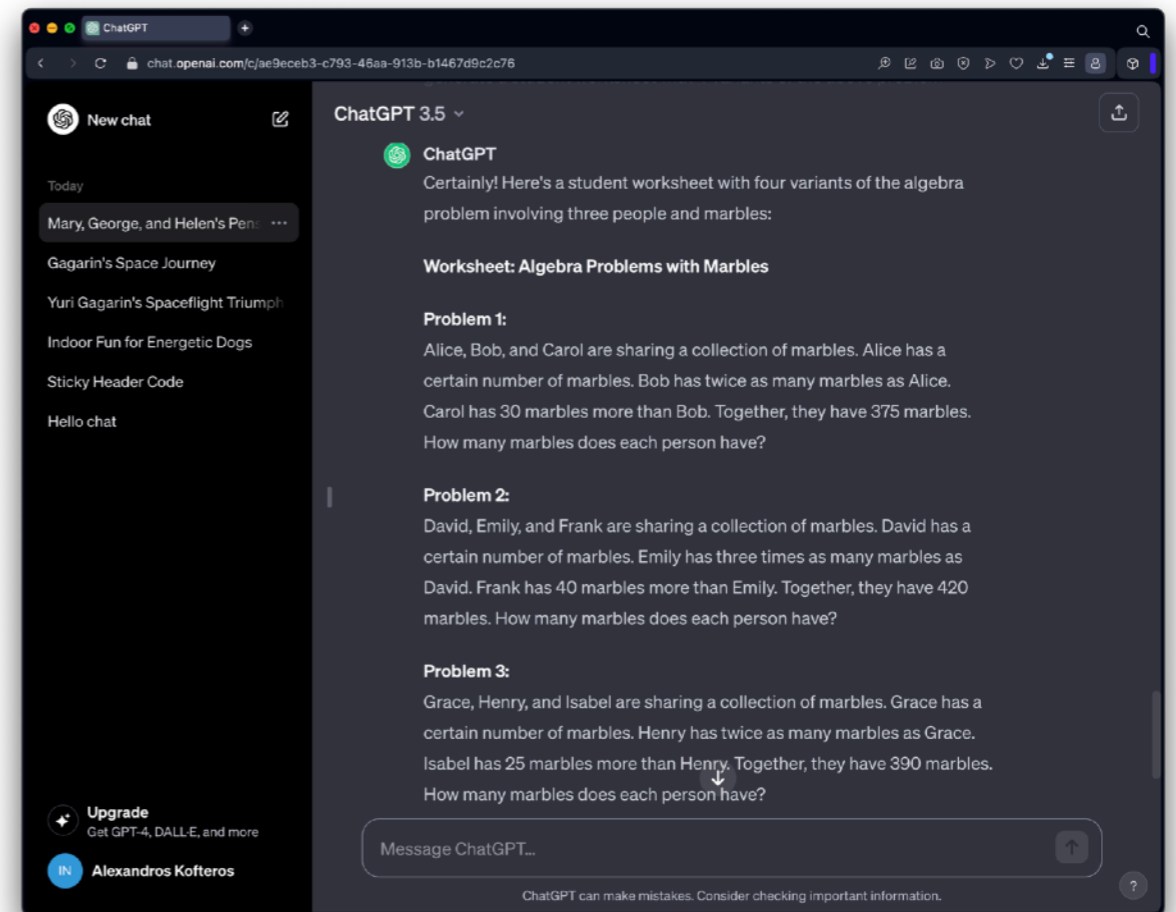
“Create an algebra problem with 3 different people, using at least one object, with numbers from 100 to 200”

Again, the problem is generated and it allows us to copy & paste it in other programs (ie word processor).

We will give ChatGPT another message:

“Generate a student worksheet with 4 variants of the above problem”

Lo and behold! A worksheet appears in mere seconds!



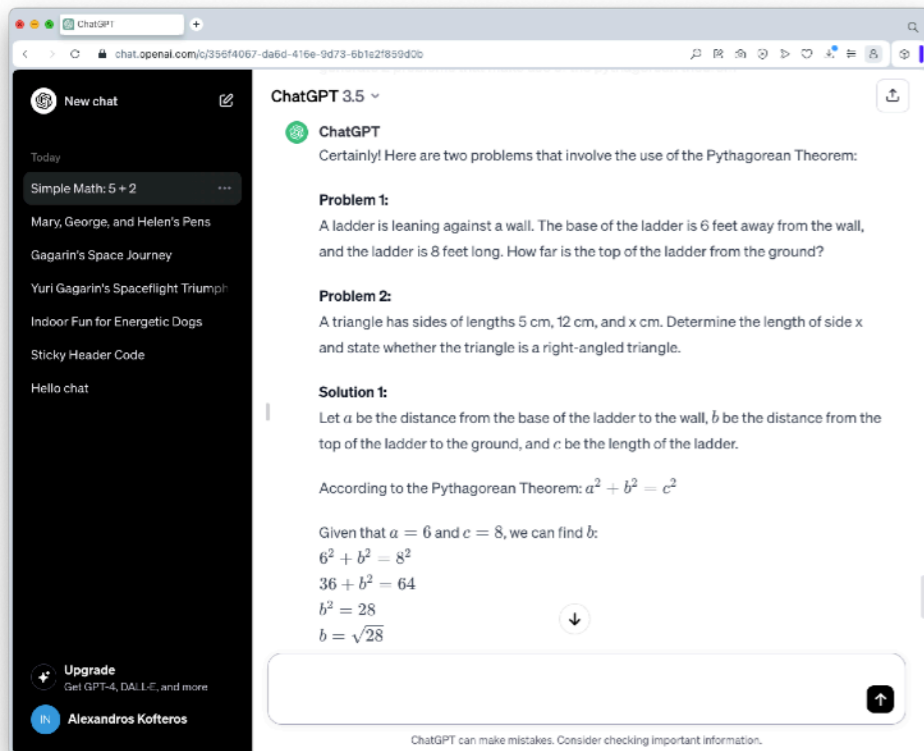
### Adapting problems to student capabilities

A significant, yet extremely time consuming task, is creating problems that are adapted to the needs of all our students. In a typical classroom, we can have as many as 5 different levels of students (mixed-ability classrooms). ChatGPT enables us to generate multiple-level problems in seconds!



Problems generated by ChatGPT can even include geometry. Let's ask ChatGPT to give us two problems that require the pythagorean theorem:

“Generate 2 problems that make use of the Pythagorean Theorem”



ChatGPT has generated (surprise! Surprise!) two problems, and is also offering their solution! But, let's take a look at Problem 1: instead of meters, it uses feet! This is because in some parts of the world (USA, mainly) they still use the Imperial system instead of the Metric. To avoid this, we can specifically ask ChatGPT to use the metric system:

“Generate 2 problems that make use of the Pythagorean Theorem but only use the metric system”

## The Imperial (British) system

The Imperial system, also known as the British Imperial system, is a system of units of measurement that evolved from the medieval weights and measures systems of England. It was later refined and standardized during the British Empire. While the Imperial system has been largely replaced by the metric system in many parts of the world, including the United Kingdom, it is still used in some countries, notably the United States.



The Imperial system includes units for measuring length, weight, capacity, and temperature, among other quantities. Some common units in the Imperial system include inches, feet, yards, miles, pounds, ounces, gallons, quarts, and pints.

For example:

- **Length:** 1 foot = 12 inches, 1 yard = 3 feet, 1 mile = 1,760 yards
- **Weight:** 1 pound = 16 ounces
- **Capacity:** 1 gallon = 4 quarts = 8 pints
- **Temperature:** Fahrenheit is the primary unit of temperature measurement in the Imperial system.



# Chapter 5: ChatGPT for Writing

# In this chapter...

In **chapter 5 "ChatGPT for Writing"**, we will:

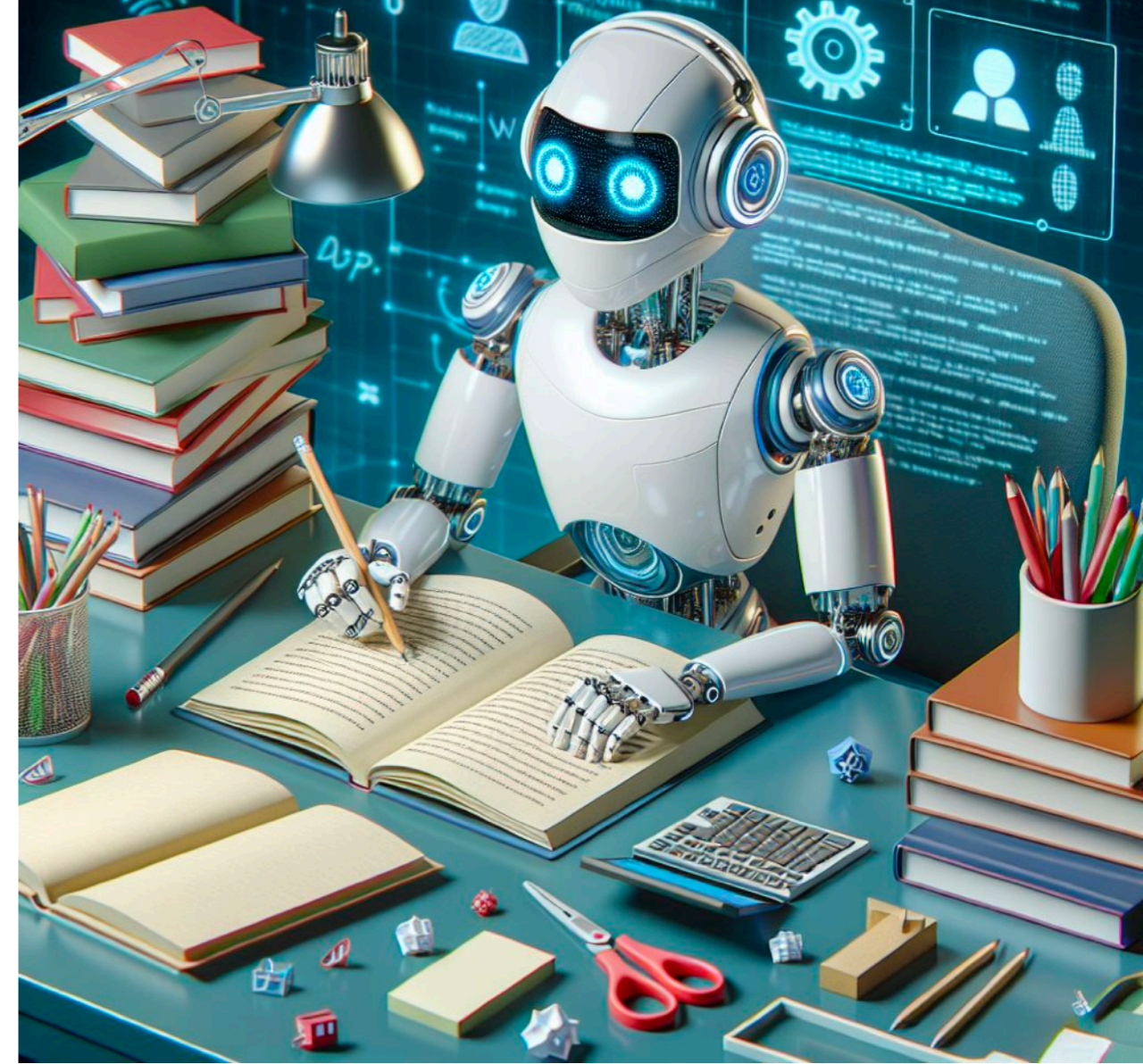
- Generate lesson plans for language teaching
- Create instructional material
- Generate exercises
- Create original text and related questions
- Learn how to create summaries based on text



# AI Essay Writing

Let's admit it: even though there are literally thousands of books we can borrow one or two pages for use in our classroom, most often than not the need arises to find a piece of text that is very specific to a specific lesson. And -let's face it- we need to constantly use new material and not regurgitate what we have been using for the past 10 years.

As an example, let's look at the ongoing discussions of using tablets instead of books. That is a solid case for discussion in the classroom. And one approach is to do just that- have a discussion with the students and write down all the arguments. Another approach is to give students a piece of text on the subject, have them read it (on their own or in groups) and then discuss it in the classroom (critical approach to reading). Then how about we find related articles for further study of the subject? Since this book is addressed to teachers, I am not going to "preach to the choir" on the benefits of this approach. However, we all know how time consuming it is to organise the information



required for such a lesson - let alone duplicate this approach even once or twice per week. Fortunately, we have AI tools for that!

## Review & Edit

AI has proven to come a long way in the past few years, with incredibly accurate information given on most topics. However, especially when delivering this information to students, we need to review what is generated by the AI tool we use and make changes wherever we feel there is ambiguity or the information might not be correct, or need to adapt for our students.



# Part C: Let's Code!

### **Short bio...**

I was born in Nicosia, Cyprus, on Christmas Eve of 1974.

My parents bought my first computer, an Atari 520STFM, in early 1988. I started programming the same year, using the Metacomco BASIC that was included with my machine, and started developing video games a year later with STOS BASIC. I began my studies at the Higher Technical Institute (Electrical Engineering) but moved after one year to the University of Cyprus for a B.A. in Education. During my studies, I bought my first Macintosh computer and with savings from my part time jobs, and a Bank Loan, I purchased Hypercard 2.2 and later Macromedia Studio 3.0 I continued my studies with an M.A. in Curriculum and Instruction and a PhD in Information and Communication Technologies.

I have been working as a teacher since 1999, with a brief hiatus from the classroom between 2009-2011 to work at the Pedagogical Institute, developing educational content for supporting ICT in Education. My personal and research interests include Online Learning Management Systems, video games in education and computer history. With my childhood friend, Nicholas Ktenas, we founded (2014) the first Cyprus Computer History Museum.

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An introductory guide for using AI in education

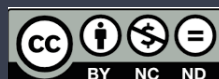
# ARTIFICIAL INTELLIGENCE: TEACHING & LEARNING WITH AI

Alexandros Kofteros, PhD

This guide is aimed mainly at teachers wishing to learn more about AI and implement related activities with their students. The (student) target group is upper primary to secondary education.

## With this guide:

- We take a glimpse at a short history of AI
- We engage in activities involving Machine Learning
- We generate images using AI
- We develop a program to recognise facial and hand gestures
- ...and we get to appreciate robots a bit more...



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