## Artificial Intelligence

IAN HANDRICKS

#### What is Artificial Intelligence?

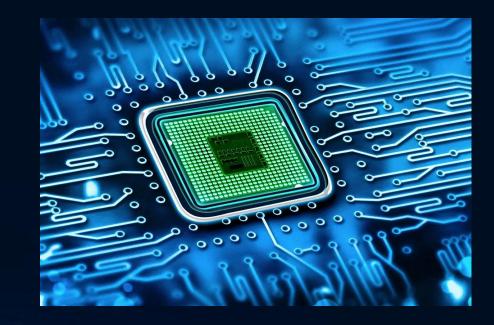
• It is the simulation of human intelligence processes by machines



#### Real Intelligence

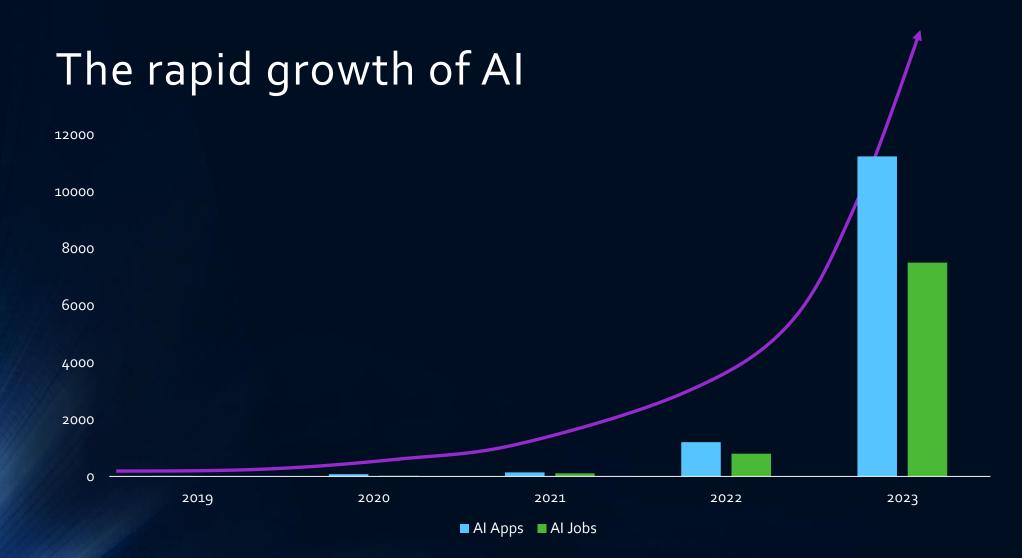


#### Artificial Intelligence



#### We have entered a new world

#### ... A world which will be significantly challenged by AI



#### Consider ...

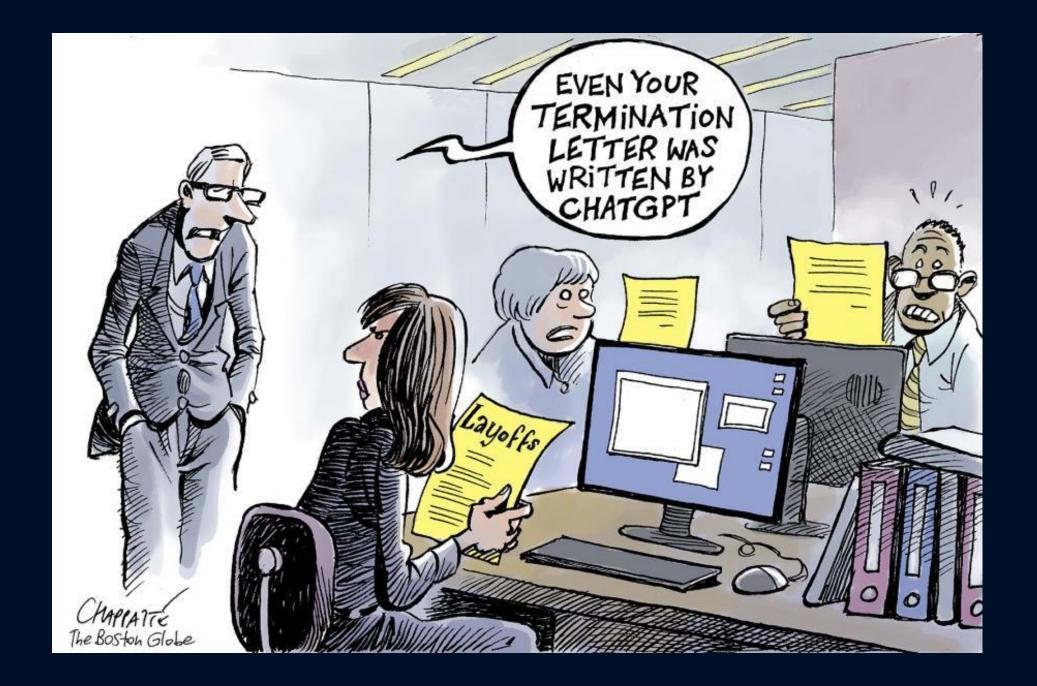
- The global AI market value is expected to reach \$267 billion by 2027.
- Al is expected to contribute \$15.7 trillion to the global economy by 2030.
- 37% of all businesses and organizations now employ AI.
- The rise of AI will eliminate 85 million jobs and create 97 million new ones by 2025.
- More than three billion voice assistants are now in use, and eight billion will be by 2023.
- The self-driving car industry could be worth more than \$600 billion over the next five years.

#### Many jobs stand to be threatened by AI

- Writers
- Journalists
- Graphic Artists
- Teachers
- Advertising agencies
- Photographers
- Copywriters

- Administrators
- Legal
- Bankers
- Programmers
- Healthcare
- Management
- Sales & marketing

- Researchers
- Traders
- Accountants
- Data analysts
- Travel agents
- Insurance advisers
- And many more



#### ... However, many tasks will be made easier by AI

- Communication
- Writing
- Repetitive tasks
- Actions requiring predictive decisions
- Targeted graphic and design
- Simplification

- Education
- Code writing and programming
- Automation
- Image processing
- aphic and Proofreading
  - Mathematics & logic
  - Comprehension

- Data entry
- Data analysis
- Pattern recognition
- Language translation
- Healthcare analysis
- Bookkeeping & accounting
- And much more!



### How should we react?

WE HAVE OPTIONS...

#### Ignore it and it will go away ... it won't!

- It is entrenched now
- It is growing rapidly
- It is becoming exponentially more powerful than we can imagine
- Many millions of people are contributing to its growth
- Thousands of new AI platforms and programs are being released daily



#### Get angry and fight it ... you won't win!

- The AI industry is enormous
- It is growing faster than any previous technology
- If you continue to hold on to traditional methods you will be overtaken and left behind by those utilizing AI



#### Learn it and use it ... you will benefit

- It will simplify your difficult tasks
- It will expand your understanding of technology
- It will provide you with solutions quickly and efficiently

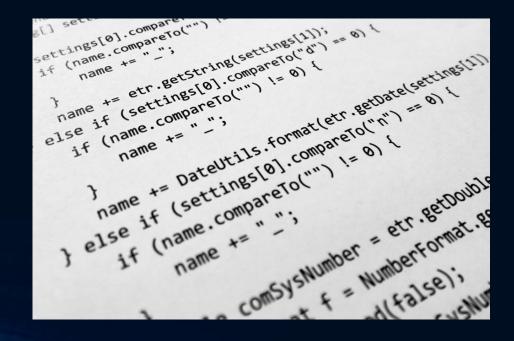




# What has changed?

#### Computer programs (before AI)

- Were generally step-by-step procedures
- One action or command followed by another ...
- With some steps being a redirection by "if then"

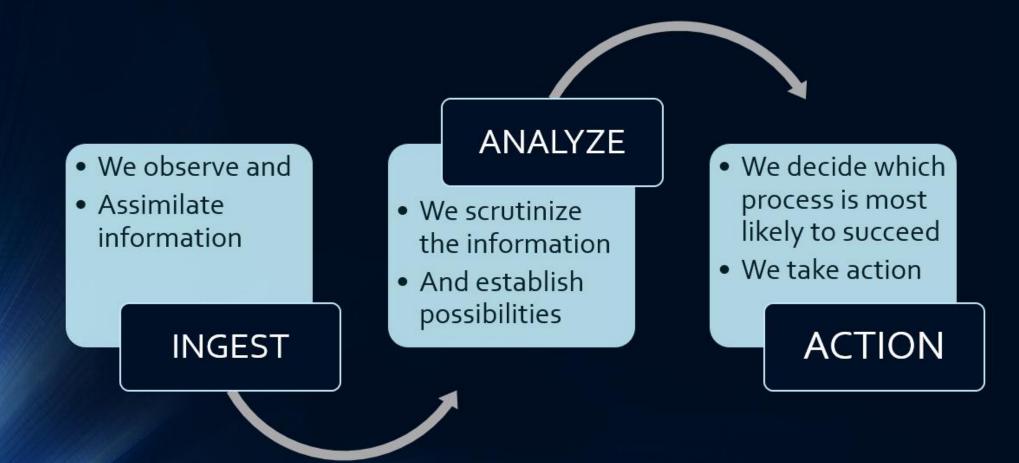


#### Al Computer programs

- Ingest large amounts of labeled training data
- They analyze the data for correlations and patterns
- Then uses these patterns to make predictions about future states

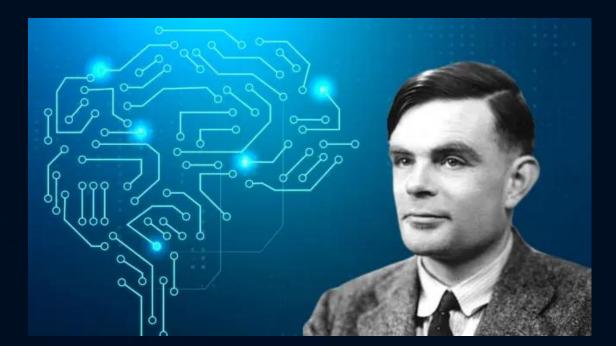


#### Humans reason and think in the same way



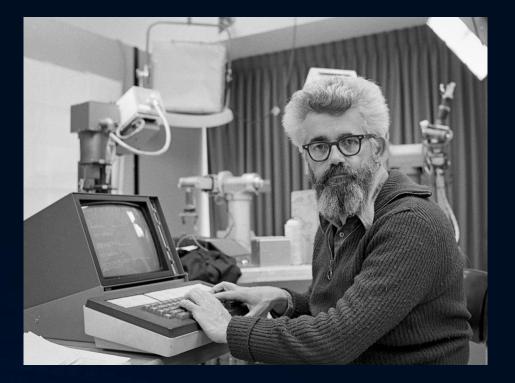
#### AI has been developed and introduced slowly ...

- 1942 The Enigma Code is broken with AI.
- Alan Turing used the observation that each German message contained a known piece of German plaintext at a known point in the message



#### The thinking machine...

• 1955 - John McArthy, the father of Al proposes an idea to design a machine that would be capable of thinking and reasoning like a human



#### The AI psychotherapeutic robot ...

 1964 - Joseph Wiezenbaum at the Artificial Intelligence Laboratory builds "Eliza", a psychotherapeutic robot that gives pre-fed responses to the users such that they feel they are talking to someone who understands their problems.



#### AI developments started gathering pace...

 1969 – "Shakey", the first general-purpose mobile robot is built. It is able to reason with its own actions



#### Checkmate!...

 1997 – "DeepBlue", a chess-playing computer developed by IBM beat the world chess champion – Garry Kasparov. This left people wondering about how machines could easily outsmart humans in a variety of tasks.



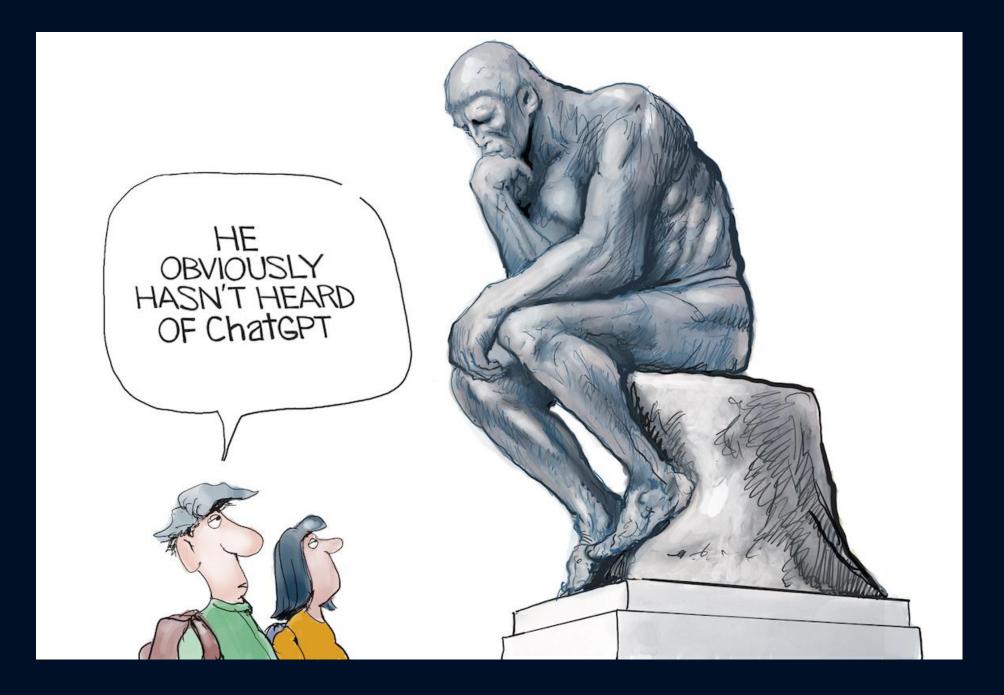
#### 21<sup>st</sup> Century Al

- 2008 "Siri" and voice recognition released in the iPhone
- 2014 "Alexa", the virtual assistant Artificial Intelligence system is available on smartwatches, car monitors, speakers, TV, and various other platforms.





- ChatGPT is launched!
- The impact of ChatGPT on the IT world is immense. It has revolutionized the way people interact with computers, making them more intuitive and user-friendly.
- It has launched a global AI development frenzy the likes of which we have never before encountered



## How does Al work?

IT FOCUSES ON COGNITIVE SKILLS ...

#### Learning

- Al acquires data and creates rules for how to turn it into actionable information.
- The rules, which are called algorithms, provide computing devices with step-by-step instructions for how to complete a specific task



#### Reasoning

• Al programming focuses on choosing the right algorithm to reach a desired outcome.



#### Self-Correction

• Al continually fine-tunes algorithms and ensures that they provide the most accurate results possible.



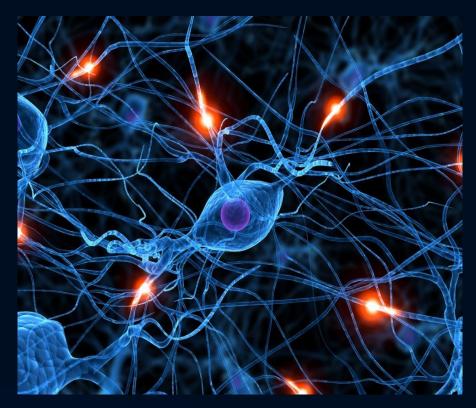
#### Creativity

• Al uses neural networks, rules-based systems, statistical methods and other Al techniques to generate new images, new text, new music and new ideas.



#### What is a Neural Network?

- It is a method in artificial intelligence that teaches computers to process data in a way that is inspired by the human brain.
- It is a type of machine learning process, called deep learning, that uses interconnected nodes or neurons in a layered structure that resembles the human brain.
- It creates an adaptive system that computers use to learn from their mistakes and improve continuously.



## ChatGPT

THE AI TOOL THAT CHANGED THE WORLD

#### What does ChatGPT stand for?

 Chat GPT stands for Chat Generative Pre-Trained Transformer and was developed by an AI research company called "Open AI"



#### How does ChatGPT work?

- It uses a large language model that checks for the probability of what words might come next in sequence
- It has a deep learning algorithm a type of transformer model in which a neural network learns context about any language pattern
- It doesn't "know" what it's saying, but it does know what symbols (words) are likely to come after one another based on the data set it was trained on.
- It uses a data set learned from a large portion of the internet. From there, humans give feedback on the Al's output to confirm whether the words it uses sound natural.

### What can ChatGPT do?

- Write stories ٠
- Compose poetry
- Write website content
- Write advertising copy
- Write letters
- Create original jokes
- Explain complex topics
- Summarize information
- Create tables of data
- Produce bullet pointed summaries Get relationship advice

- Write speeches
- Write in the style of virtually any author
- Simplify written data
- Turn data into prose
- Write for a specific age group
- Solve tricky math problems
- Extract data from content
- Proofread and correct
- Translate into virtually any language

- Write plays
- Write music in almost any genre
- Write, debug, and explain program code
- Create content in multiple languages
- Prepare for a job interview
- Write emails
- Write essays on almost any topic
- Be a chat companion •
- Write CV's and cover letters
- ...and much more





### Some facts about ChatGPT

- ChatGPT was used by more than 10 million users within 5 days of its release
- ChatGPT analyzed more than 570 GB of text on the Internet to gain a deep understanding of the natural human language
- ChatGPT passed the US Medical Licensing Examination, achieving a 90% accuracy in its answers, without any assistance of a human clinician
- ChatGPT passed the Law Bar Examination, achieving it's result in the 90<sup>th</sup> percentile, without any assistance of a human clinician

### Some more facts about ChatGPT

- Nearly 176 billion parameters were used to train ChatGPT
- ChatGPT version 4 is likely to be 40% more accurate and factual than ChatGPT version 3.5
- By June 2023 there were 1.6 billion registered users of ChatGPT (that is 20% of the entire planet's population!)
- Microsoft is the largest investor in ChatGPT (OpenAI)
- ChatGPT learns from its interactions with users and improve its responses over time

### ChatGPT takes a mighty leap ...

- ChatGPT have just opened their system to support Plugins
- Plugins are tools specifically designed to utilize the power and structure of a host entity, with safety as a core principle, that helps access up-to-date information or use third-party services
- This means that ChatGPT is no longer restricted to the data it was given in its creation phase – it now has access to the whole of human knowledge
- It also means it can now perform tasks on information stored on your computer, in the cloud and connect you with an infinite array of third-party services



### Prompts HOW WE INSTRUCT AI

### AI Platforms respond to our instructions

- These instructions are called "prompts"
- The more specific a prompt is, the more appropriate will be the reply



### How to write great Al Prompts

- Start with a clear objective (write an essay, compose a poem, ...)
- Keep it simple (in bullet point form, do not use flowery language, ...)
- Use specific keywords ("determined", "active", ...)
- Indicate mood (enthusiastic, encouraging, concerned, ...)
- Specify number of words required (in 300 words, 20-minute, ...)
- Use examples (like a jingle, like a song, ...)
- Determine your audience (for a 5-year old, for engineers ...)
- Indicate the style (gothic, romantic, critical, journalistic...)

### An example ...

- Write about a cat
- Write a 100-word story about a cat
- Write a 100-word story about a cat called "Fluffy"
- Write a 100-word story about a cat called "Fluffy" for a 6-year old
- Write a 100-word story about a cat called "Fluffy" for a 6-year old in the style
  of Enid Blyton
- Write a 100-word story about a cat called "Fluffy" who loves playing with a ball of wool for a 6-year old girl called Mary in the style of Enid Blyton



### WRITE ABOUT A CAT

Write a 100-word story about a cat

In a quiet village, a mysterious cat named Luna roamed the moonlit streets. With fur as dark as the night sky, she glided through the shadows, leaving whispers of magic in her wake. Luna's eyes sparkled like distant stars, enchanting all who dared to gaze upon her. No one knew where she came from or how she acquired her ethereal grace. Some believed she was a celestial visitor, while others thought she was a guardian spirit. Regardless, Luna bestowed her gentle presence upon the village, bringing comfort and wonder to all, her enigmatic allure forever woven into their hearts.

### WRITE ABOUT A CAT

Write a 100-word story about a cat called "Fluffy" who loves playing with a ball of wool for a 6year old girl called Mary in the style of Enid Blyton

Once upon a time, in a quaint little cottage, lived a mischievous cat called Fluffy, and her dearest friend, a sweet 6-year old girl named Mary. Fluffy's days were filled with joy as she frolicked in the garden, but her heart soared when Mary appeared, carrying a ball of wool. Together, they danced and twirled, playing delightful games of catch and chase. Oh, the laughter that echoed through the cottage as Fluffy's tiny paws batted at the wool! Mary and Fluffy shared a bond so special that their adventures became the stuff of legends, enchanting all who witnessed their magical friendship.

### Key phrases for your prompt might include:

- Extract email addresses from [insert the text that contains the addresses]
- This will produce a list of just the email addresses (with no duplicates)
- Make a table of European countries, their population, capital and land are
- This will produce a table with 4 columns with the data you requested
- Write code in C++ to find the sum of 5 digits and then divide by a prime number
- This will produce code in C++ that does exactly what you asked for

### More key phrases for your prompt might be:

- Write a bullet point summary of NZ's Resource Management Act
- This will produce a bullet point summary as requested
- Write a song about Rugby and include the chords
- This will write an original song about Rugby with chords in the right place
- Explain the difference between butter and margarine
- This will give you the detailed explanation you requested



### Ownership AI & COPYRIGHT

### Words, artwork etc. created using AI ...

- ... cannot be Copyrighted!
- A work of art created by artificial intelligence without any human input cannot be copyrighted under U.S. law, a U.S. court in Washington, D.C., has ruled (August 20, 2023)
- Only works with human authors can receive copyrights, U.S. District Judge Beryl Howell said on Friday, affirming the Copyright Office's rejection of an application
- Creative work made by artificial intelligence is ineligible for copyright



## Mixed Media

OTHER AI PLATFORMS

### AI Platforms are now readily available to ...

- Write words, poems, stories, essays, journalism ...
- Create photographs
- Create pictures and all forms of artwork
- Synthesize voices
- Convert sketches to photos and artworks
- Create original music
- Repair, restore, colourise and enhance photos
- Animate photos into videos
- Write program code, solve mathematics ... and much more

# Image Editors

AI PLATFORMS THAT AFFECT CHANGES TO PHOTOS

### GFP-GAN IMAGE EDITING

Uses AI to sharpen and bring detail to very blurry and low resolution images



#### Photo restoration with GFP-GAN

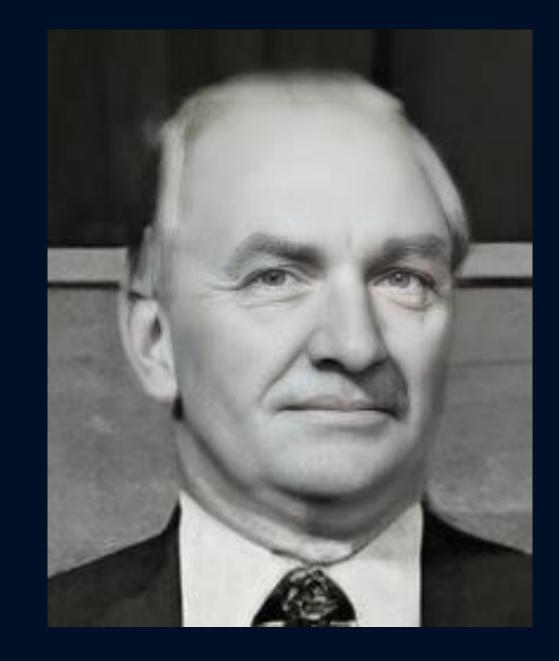
Restore old photos using our photo restoration application, built with Baseten and powered by the <u>GFP-GAN</u> model.

Upload the photo you want to retouch, then click the "Restore photo" button. The restored image will display on the right for you to download.

If you don't have a photo to restore, choose a photo from the gallery below.







### MY HERITAGE COLORIZE

**IMAGE EDITING** 

## Uses AI to turn black and white photographs into colour photos

#### See your heritage in color

Upload black & white or faded color photos and be amazed by the results

🖞 Upload photo

OR DRAG AND DROP V

COLORIZE

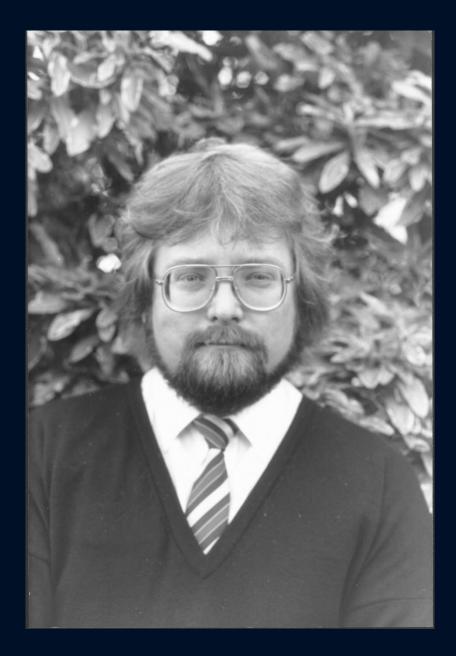


Colorize your black & white photos using the world's best deep learning technology



RESTORE COLORS NEW

Restore the colors in faded color photos with the world's best color restoration technology





### MY HERITAGE COLORIZE

**IMAGE EDITING** 

## Uses AI to fully restore old images that have gone "red"

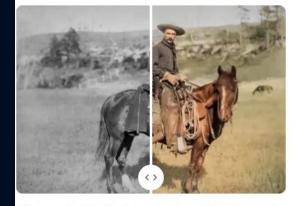
#### See your heritage in color

Upload black & white or faded color photos and be amazed by the results

🖞 Upload photo

OR DRAG AND DROP V

COLORIZE



Colorize your black & white photos using the world's best deep learning technology



Restore the colors in faded color photos with the world's best color restoration technology

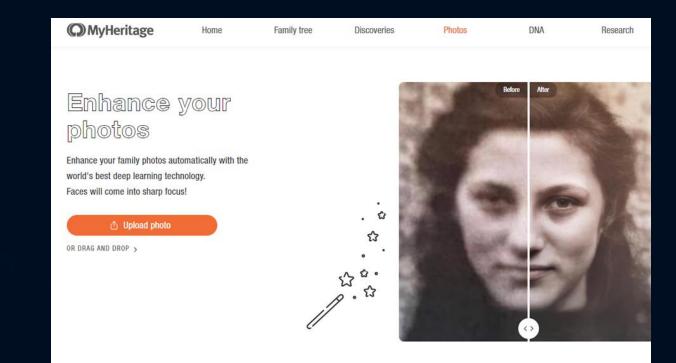




### MY HERITAGE ENHANCE & REPAIR

#### **IMAGE EDITING**

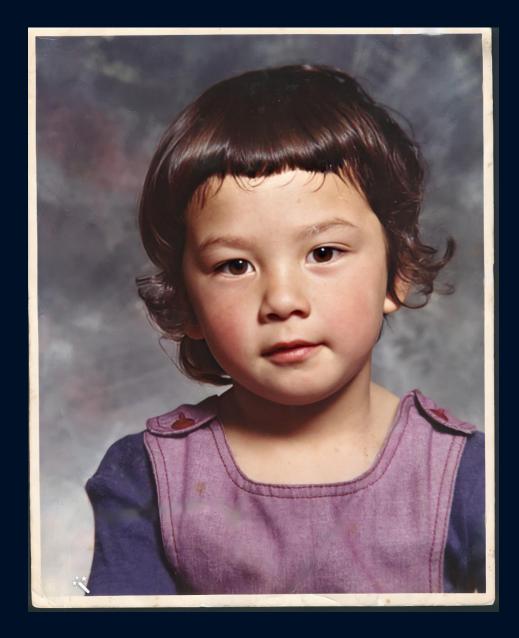
## Uses AI to fully restore damaged photos



Gallery







### REMOVE.BG

#### **IMAGE EDITING**

Uses AI to automatically identify the background in an image, then removes it and allows for a replacement background if required



### Remove Image Background



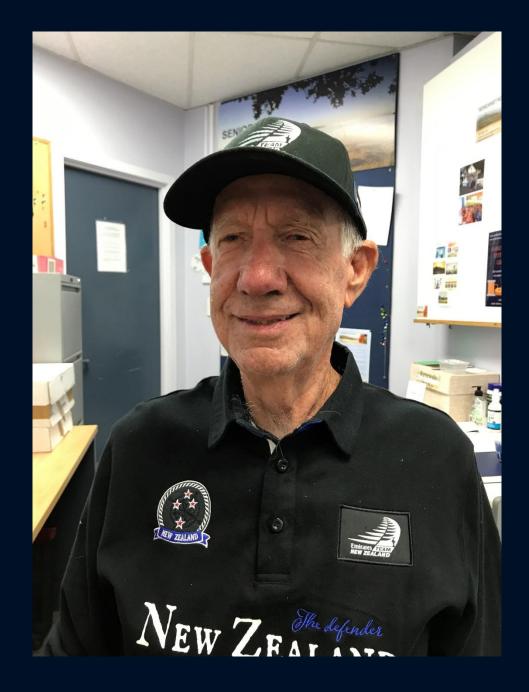
Upload Image

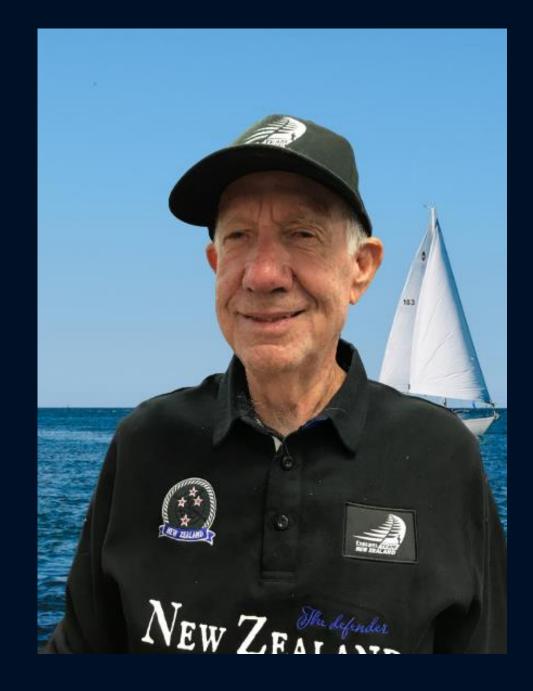
or drop a file, paste image or <u>URL</u>

No image? Try one of these:



By uploading an image or URL you agree to our <u>Terms of Service</u>. This site is protect hCaptcha and its <u>Privacy Policy</u> and <u>Terms of Service</u> apply.





### CLEANUP.PICTURES

**IMAGE EDITING** 

Uses AI to remove any unwanted object in an image and then automatically and accurately fills in the detail that has been removed

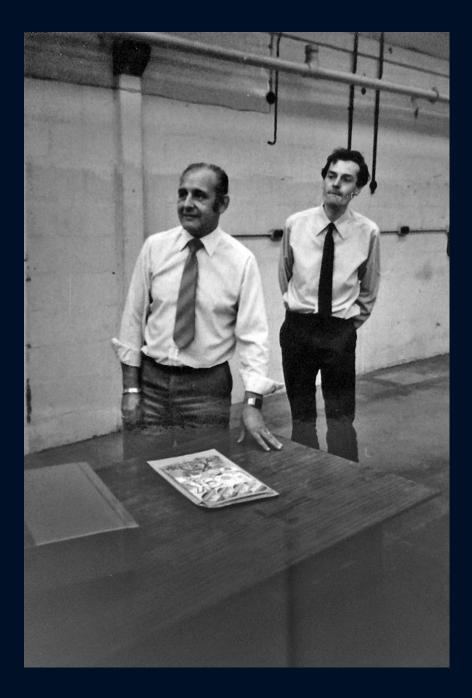
Remove any unwanted object, defect, people or text from your pictures <u>in</u> seconds

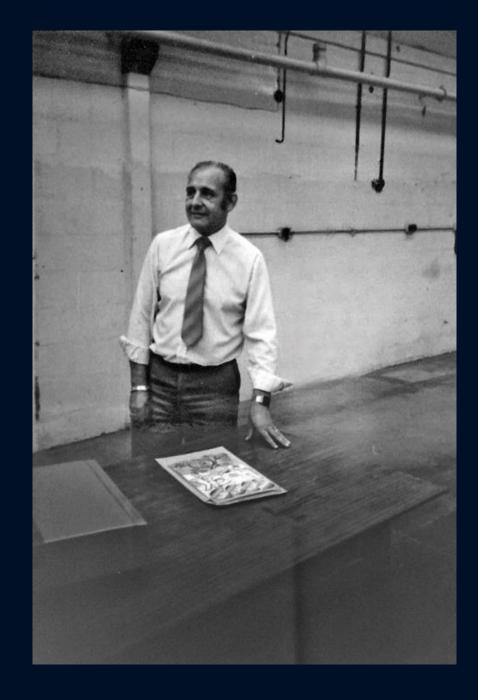




↓ Try with an example





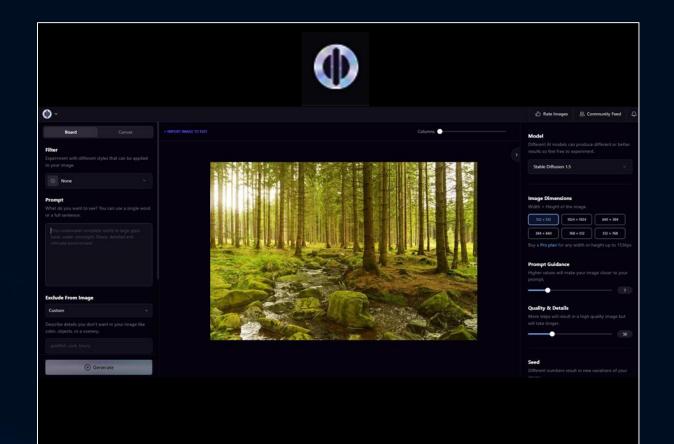


### **Image Creators** AI PLATFORMS THAT CREATE ORIGINAL IMAGES

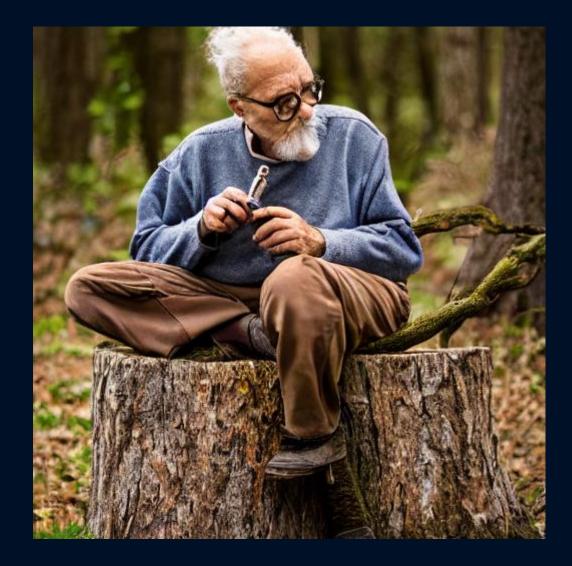
### PLAYGROUND

#### **IMAGE CREATION**

## Uses AI to create images from a verbal description (prompt)



A photo of an old man smoking a pipe sitting on a tree stump in a magical forest



### SCRIBBLE DIFFUSION

**IMAGE CREATION** 

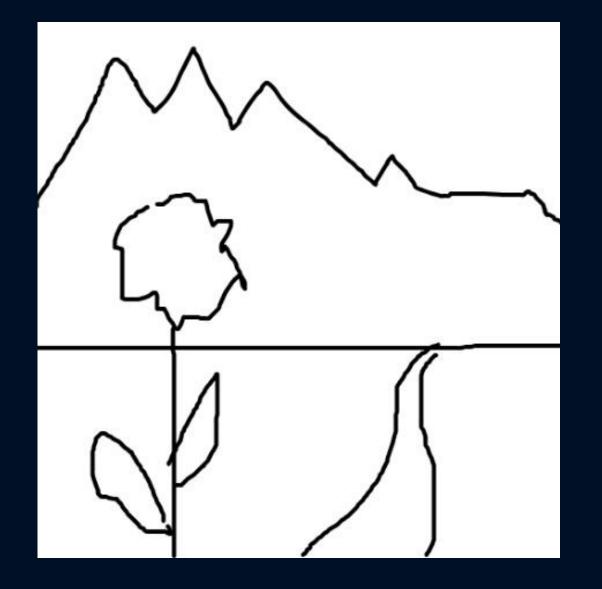
## Uses AI to create images from a rough sketch

#### **Scribble Diffusion**

Turn your sketch into a refined image using AI



a goofy owl





A photo of a long-stem red rose with green fields, a meandering driveway, blue sky with clouds and mountains in the background

# Other Applications

AI PLATFORMS THAT PERFORM A VARIETY OF TASKS

## ELEVEN LABS

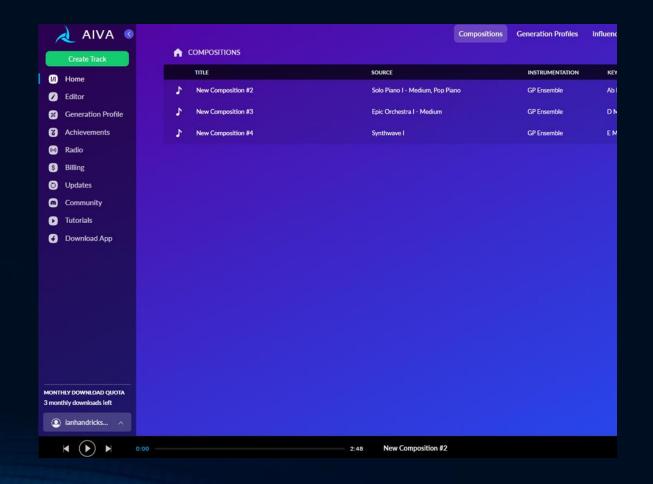
#### SPEECH SYTHESIS

# Uses AI to create voices and duplicate human voices

II	Ele	eve	nLa	abs		Speech Synthesis VoiceLab Voice Library History Resources	
					0		
					Speech Sy	ntnesis	
					Unleash the power of	f our cutting-edge technology to generate realistic, captivating speech in a wide range of languages.	
					Settings	Arnold	
						Voice Settings	
						Eleven English v1	
					Text	Group insurance is the best thing since sliced bread	
						Group insurance is the best thing since street bread	
						52 ( 2600 Tatal queto o	

## AIVA MUSIC CREATION

# Uses AI to write music and synthesize full orchestrations



## FONTJOY AI FONT DETERMINATION

# Uses AI to recommend fonts and font combinations

lsernit 葉 Lora. ₽

Font pairing made simple

Generate font combinations with deep learning

Click (Generate) to create a new font pairing, (Lock) to lock fonts that you want to keep, and (Edit) to choose a font manually. The text is editable, try replacing it with your company name or other copy.

The goal of font pairing is to select fonts that share an overarching theme yet have a pleasing contrast. Which fonts work together is largely a matter of ntuition, but we approach this problem with a neural net. See Github for more echnical details.

How it works Github Font visualizer Logo maker

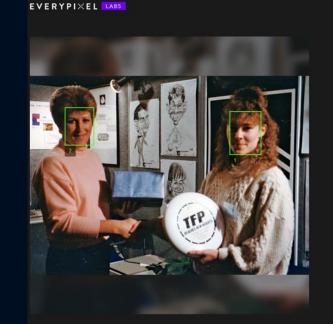
🗯 Generate

Keep in touch news related to Fontjoy and deep learning, a few times a year.

## EVERYPIXEL LABS

#### AI PHOTO AGE RECOGNITION

Uses AI to determine the ages of people in a photograph



# We found 2 persons at the picture

Person 1	20
Person 2	39
Start using this Af	PI→

Video Keywording Stock Photo Scoring

TRY OUR SAMPLES



products demo documenta

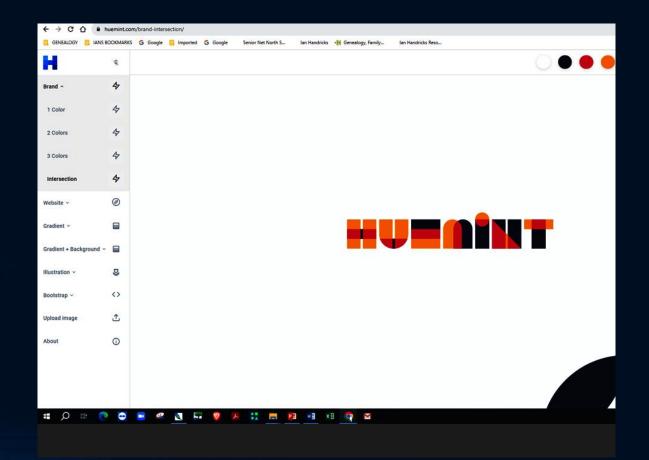
UGC Photo Scoring

LINK

# HUEMINT

#### AI COLOUR GENERATOR

# Uses AI to determine colours and best colour combinations



# PATTERNEDAI

#### **AI PATTERN GENERATOR**

#### Uses AI to create an infinite variety of patterns



growth.

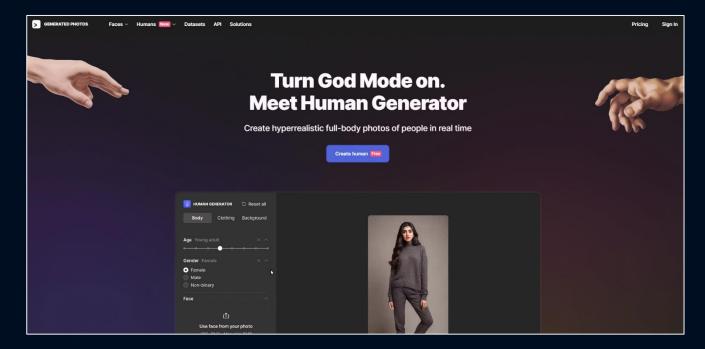
Join Waiting List for Busines

LINK

## HUMAN MAKER

#### AI HUMAN GENERATOR

# Uses AI to create a defined human being



## OUIZ MAKER AI CONTEXT QUIZ GENERATOR

Uses AI to create a multi-choice set of questions and answers based on a sample of text

## **Al Quiz Maker**

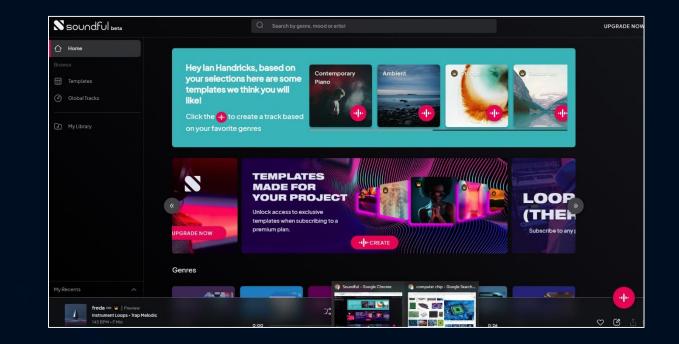
Convert any text into an interactive quiz in seconds.

Text to use		0 / 5,000
Copy & paste the te	ext you'd like to generate a quiz f	or.
Dr, try a sample like <u>Wor</u>	ld War 2, <u>Trivia</u> or <u>Barack Obama</u>	
Difficulty	Design	
Medium	V Aa Ne	eon 🗸 🗸 🗸
	Generate quiz	
	y Generate quiz	

# SOUNDFUL

#### AI MUSIC GENERATOR

# Uses AI to create original music in any genre



# Application USING AI

# How can you utilise Artificial Intelligence?

- All forms of writing
- Photo manipulation
- Summarising & simplifying
- Education
- Extracting & translating
- Enjoyment & pleasure

#### **EXPRESSIONS OF INTEREST**

WRITING

- Letters, emails, notes, articles, diaries ...
- Poems, lyrics, captions, catchphrases, slogans ...
- Essays, reports, statements, recipes, journalism ...
- Web content, computer coding, blogging ...
- Stories, fairy tales, novels, biographies ...
- Problem-solving, mathematics, logic...
- Resumes, CV's, covering letters, proposals ...
- Speeches, presentations, technical documentation ...

# PHOTO MANIPULATION

#### A DIFFERENT PICTURE

- Colourise
- Restore
- Sharpen and improve detail
- Change backgrounds
- Remove objects
- Enhance
- Animate
- Bring to life with dialogue



# SUMMARISE & SIMPLIFY

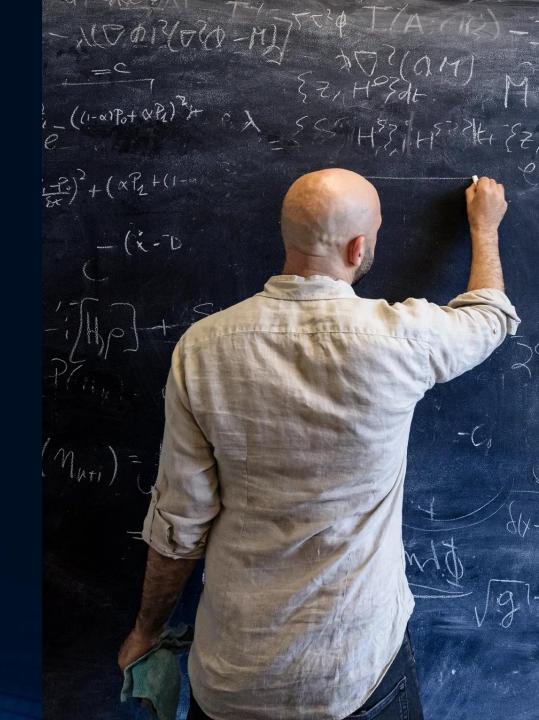
**PRÉCIS PRECISELY** 

- Bullet point lists
- Summaries of long text
- Tables and grids
- Simplification of language
- Write for an age group
- Key points



### EDUCATION THE PURSUIT OF WISDOM

- Access to knowledge
- Dissection of process
- Comparison and evaluation
- Seeding thought
- Concept expressing
- Logic and structure



# EXTRACTION & TRANSLATION

MINING & MIMING

- Extract data from text volume
- Find strings from data blocks
- Translate from and into any language



# ENJOYMENT & PLEASURE

#### SONG & DANCE

- Create music
- Write poetry
- Make art
- Play games
- Create voices
- Hold a conversation
- Make movies
- Create photographs



# Looking Forward

# What is the future of Artificial Intelligence?

- Speed of life
- End of privacy
- Thicket of AI law
- Human-AI teaming

# SPEED OF LIFE

TEMPO

- The most obvious change that many people will feel across society is an increase in the tempo of engagements with large institutions.
- Any organization that engages regularly with large numbers of users will be compelled to implement AI in the decisionmaking processes.
- AI will allow these organizations to make most of the decisions much more quickly.
- As a result, we will all feel life speeding up.





# END OF PRIVACY

EXPOSED

- Society will also see its ethical commitments tested by powerful AI systems, especially privacy.
- Al systems will likely become much more knowledgeable about each of us than we are about ourselves.
- As the cost of peering deeply into our personal data drops and more powerful algorithms capable of assessing massive amounts of data become more widespread, we will probably find that it was a technological barrier more than an ethical commitment that led society to enshrine privacy.



# THICKET OF LAW

- We can also expect the regulatory environment to become much trickier for organizations using AI.
- Presently all across the planet, governments at every level, local to national to transnational, are seeking to regulate the deployment of AI.
- We can expect AI laws drafted & implemented
- The legal complexity of doing business will grow considerably in the next five years as a result.



# HUMAN-AITEAMING

COLLABORATION

- Much of society will expect businesses and government to use AI as an augmentation of human intelligence and expertise, or as a partner, to one or more humans working toward a goal.
- Human-AI teaming, or keeping humans in any process that is being substantially influenced by artificial intelligence, will be key to managing the resultant fear of AI that permeates society.

SOME FELLA FROM THE COLLEGE SAID A.I. COULD HELP RUNTHE FARM, BUT I TOLD HIM I'M STICKIN' WITH E.I.E.I.O.



# Summary WHERE TO FROM NOW

## OUR CHALLENGE

PROMISE

The future of AI holds immense promise, but also requires careful navigation of challenges to harness its potential for the betterment of society while ensuring responsible and ethical development.



# DEVELOPMENT

ADVANCEMENTS

- Rapid Advancements: AI has witnessed remarkable progress, thanks to deep learning, big data, and improved hardware, enabling it to excel in tasks like image recognition, natural language processing, and game playing.
- Autonomous Systems: Self-driving cars, drones, and robots have become more sophisticated, demonstrating the potential for AI-powered autonomous systems in various industries.
- Natural Language Processing: AI-driven language models can now generate human-like text, facilitate language translation, and assist in content creation.

# DEVELOPMENT

ADVANCEMENTS



- Healthcare Revolution: AI aids in medical diagnoses, drug discovery, and personalized treatment plans, potentially revolutionizing healthcare outcomes.
- Al in Finance: Al algorithms are widely used in trading, risk assessment, fraud detection, and customer service within the financial sector.
- Smart Assistants: Virtual assistants like Siri, Alexa, and Google Assistant have become integral to daily life, performing tasks and answering queries through voice recognition.

# FUTURE

TRENDS



- Explainable AI: As AI systems become more complex, there's a growing emphasis on making their decision-making processes transparent and understandable.
- Al Ethics: Addressing biases, fairness, and accountability in Al systems is crucial to avoid perpetuating social inequalities.
- Al and Creativity: Al-generated art, music, and literature are gaining prominence, raising questions about the intersection of Al and human creativity.

# FUTURE

TRENDS



- Al in Education: Personalized learning experiences powered by Al are on the rise, adapting content to individual student needs.
- Al in Climate Change: Al can contribute to environmental monitoring, predictive modeling, and optimizing resource usage for sustainable practices.

## MORE FUTURE

MORETRENDS



- AI and Jobs: Automation might lead to job displacement in some sectors, but it can also create new opportunities in AI development, maintenance, and integration.
- Healthcare Transformation: AI-powered diagnostics, drug discovery, and telemedicine could redefine healthcare, making it more efficient and accessible.
- Collaborative AI: Humans and AI systems will likely collaborate more closely, enhancing productivity and problem-solving across various domains.

## MORE FUTURE

**MORE TRENDS** 



- Al Regulation: Governments and organizations are likely to implement stricter regulations to ensure AI development aligns with societal values and safety standards.
- General AI: Achieving AGI (Artificial General Intelligence), where machines can perform any intellectual task that a human can, remains a distant but tantalizing goal.

## CHALLENGES

STEWARDSHIP



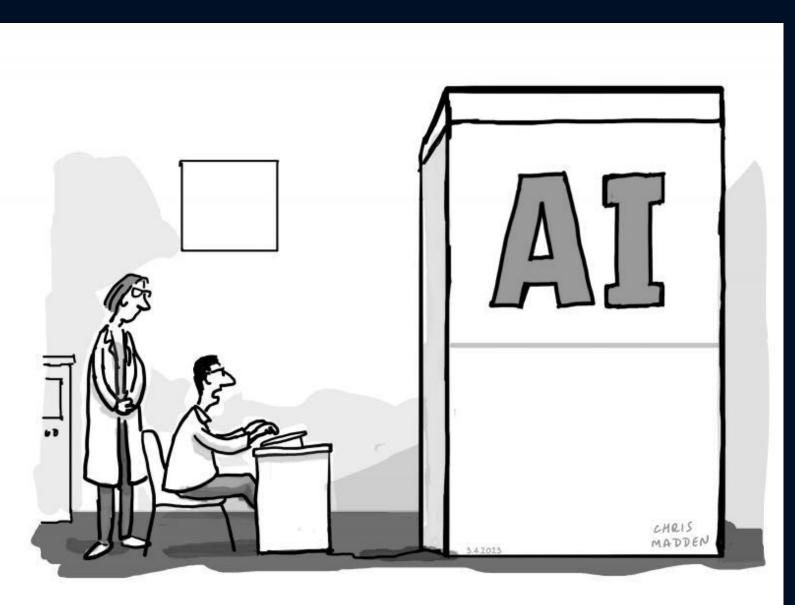
- Data Privacy: Balancing AI advancements with the protection of user data and privacy poses significant challenges.
- Bias and Fairness: Addressing biases inherent in AI models and ensuring fairness across diverse populations is an ongoing concern.
- Unemployment: Automation may lead to job displacement, necessitating strategies for reskilling the workforce.

## CHALLENGES

STEWARDSHIP



- Ethical Dilemmas: AI systems can create ethical dilemmas, such as autonomous vehicles making life-and-death decisions.
- Security Risks: AI can be exploited for cyberattacks and misinformation, demanding robust security measures.



"We've got a problem. I've turned it on but I can't turn it off again."