
ChatGPT & The
Future Of Everything
PRESCOUTER 2023

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ChatGPT is the tip of the iceberg. Though it's merely autocomplete on steroids, ChatGPT is among the first of many large AI models *racing* to gain widespread adoption in the next few years, with each bringing about a new wave of knowledge automation. Knowledge workers - from writers to lawyers - face an existential crisis. Nevertheless, there is still time to adapt.

In 2011, venture capitalist Marc Andreessen coined the phrase "software is eating the world". Since the dawn of the microprocessor, a number of successive software platforms have emerged to transform industries and society at large.

The autocomplete feature in search boxes has evolved - through breakthrough large AI models - to become a formidable platform in its own right. A race is underway between large AI models, such as ChatGPT, to become the defacto Artificial General Intelligence (AGI) standard - where computer intelligence becomes indistinguishable from human intelligence.

The winners of this new platform race are poised to emerge as the next big software platforms. The casualty will be knowledge work - jobs primarily involving the use of cognitive skills and knowledge - disrupted in the same way that Windows disrupted typewriters, the Internet disrupted newspapers and iOS/Android disrupted film cameras and the taxi industry (via Uber).

> With this new generation of AI, we get to reimagine pretty much everything about how the world works.

Charles Wright
Director of Data Innovation, PreScouter

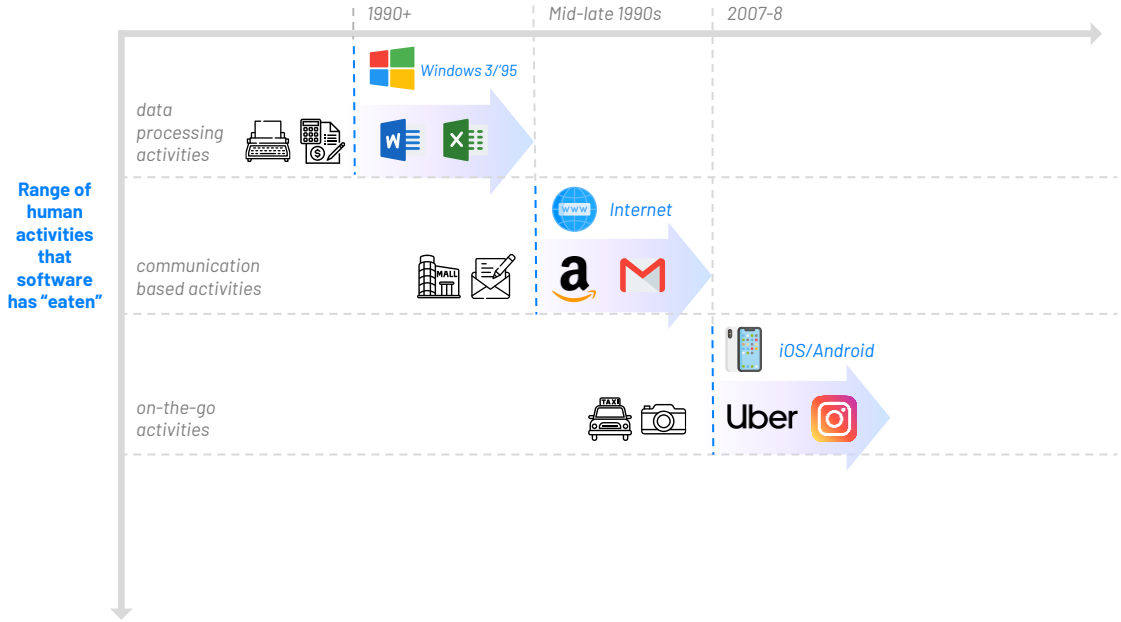
Software platforms have been eating the world.

Windows: Windows 3, and then '95, provided software developers with a platform of libraries that made it far easier for them to build graphic user interface (GUI) based applications. Microsoft's own Word and Excel applications, built on top of Windows, succeeded in creating a user experience that made computing accessible to a wider audience than using text-based user interfaces (TUI), typewriters or handwritten ledgers.

The Internet: With greater household access to broadband internet, web browsers became another platform, enabling a plethora of applications to enhance human productivity. While Windows was a user interface platform, the internet was a large scale, instantaneous communication platform. From classifieds to shopping and letters, further categories of human activity could now be conducted more efficiently.

iOS/Android: While Windows remained a defacto desktop user interface platform, the iPhone's iOS - and later Android - put computers in pockets, enhancing activities ranging from taking and sharing photos (via Instagram, for example) to hailing taxis (Uber). Some activities that previously required users to be deskbound, such as sending emails and shopping, could also now be done away from the desk.

Major platform launches that have enabled new types of applications, over time.

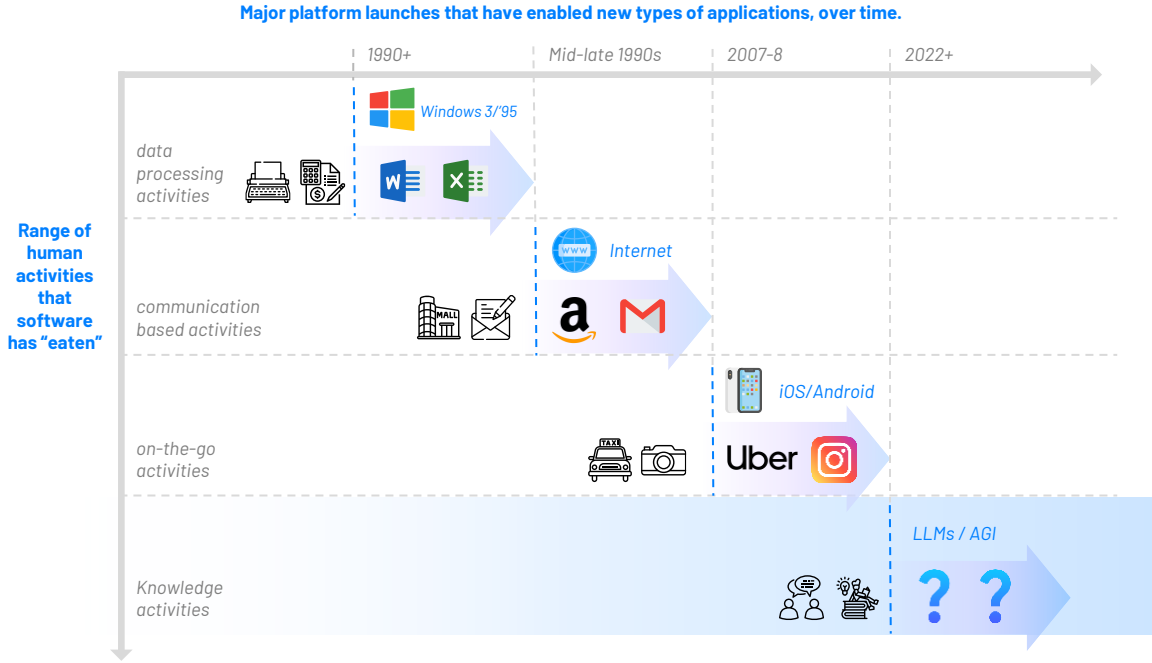


Knowledge work is next on the menu.

Windows, the Internet and iOS/Android each provided a foundation of new capabilities on which new-to-the-world applications could be invented. Similarly, **Large Language Models (LLMs) are emerging as the next platform** – enhancing human activities yet to be touched by software, as well as reshaping activities already supported by applications on existing platforms.

To date, artificial intelligence (AI) models have been custom built from scratch for each specific use case. To detect fraudulent credit card payments, for example, historical payment records are labeled fraudulent and genuine to train an AI neural network to recognize the characteristics of payments in either category. The trained models is then able to predict, for a new payment - and its characteristics - if the payment is fraudulent or genuine.

Rather than optimized for a single use-case, such as fraudulent payments, **LLM models - such as ChatGPT - are pre-trained on all the freely available data on the web to address a wide range of queries posed to them**. LLMs do this by building a gigantic probabilistic data model of grammar, meaning and knowledge. **LLM model developers strive for these models to become Artificial General Intelligence (AGI) models comparable to human intelligence**.



What's The Technological Breakthrough?

The uncanny human-like intelligence of ChatGPT is due to its underlying technology: the *Transformer architecture*, a breakthrough in AI technology.

The sudden "overnight" success of AI models is rooted in the confluence of three factors.

- The availability of large amounts of data, freely found by scraping the Internet.
- Sufficient computing power becoming available, through first NVIDIA allowing their GPUs - a type of microprocessor - to be used as general purpose super-computers, and then researchers at Stanford showing how to exploit this power for AI applications in 2012.
- Algorithmic progress, as more computationally intensive and data-hungry neural network models became more viable to operate. Specifically, the Transformer architecture, introduced in 2017 by Google, has quickly become a popular and effective approach to a wide range of AI tasks.

Transformers are the closest thing we have to creating truly intelligent machines. These AI models have the ability to understand human language, learn from vast amounts of data, and perform tasks that were once thought impossible. With their potential to transform industries and improve our daily lives, Transformers are one of the most exciting advancements in technology today.

Transformer architectures are a breakthrough in computers “understanding” natural language.

The Transformer architecture was the first to be able to permutate and combine all the words provided in a sentence to fully “understand” the relationships between words in a sentence, as humans can.

Transformers create an algebraic map of how each element in a sentence is related to the others, capturing complex dependencies in the sentence.

ChatGPT, which uses GPT3.5 or GPT4 - OpenAI’s Generative Pre-trained Transformer - is a Large Language Model (LLM). LLMs are trained on vast amounts of data and were initially designed for use in language applications, such as translation, as indicated by their name. However, the underlying mechanisms have been found to be just as applicable for “translating” words into images, music or software code. Due to this evolution, LLMs are also sometimes referred to as Generative AI, Foundation Models or simply Large Models.

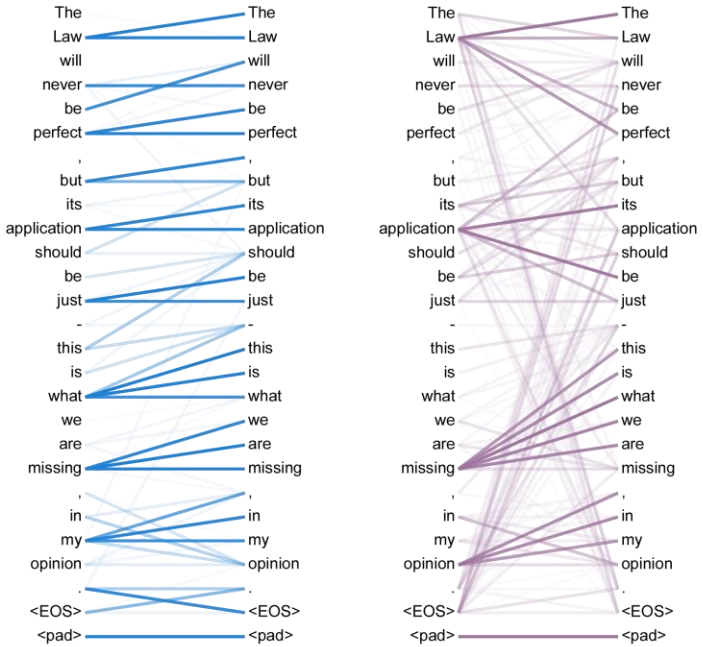


Figure. Visualizing part of the algebraic map of attention relationships in a sentence. Source: Attention Is All You Need

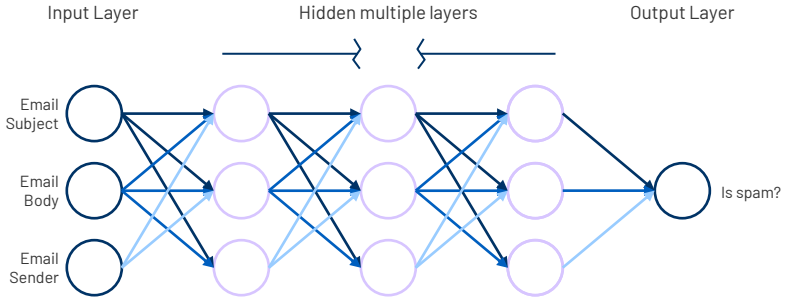
ChatGPT uses GPT, a Transformer architecture trained to auto-complete concepts learned from on the Internet.

AI models are neural networks that are “trained” by taking pairs of inputs and outputs. Once trained, they are able to predict new outputs for a given input.

OpenAI - the creators of ChatGPT - took the Transformer architecture and trained it on 45 terabytes of text data (~570 billion words), largely from the Internet, to create GPT, Generative Pre-trained Transformer.

Because the Transformer architecture “understands” the relationships between words in a sentence, as humans can, and because of greater occurrences of the phrase “the cat sat on the mat” than “the cat sats on the mat”, for example, GPT is able to organically learn concepts related to grammar. Similarly, GPT has developed other emergent capabilities, such as understanding math and world knowledge.

OpenAI took the GPT model and shaped it into a chat focused chat application to create ChatGPT.



In this email SPAM filter example, the network is trained on past data of incoming emails and whether they are spam or not. Once trained, the network predicts correct outputs for a new inputs.

How GPT Learns

GPT learns grammar and other capabilities from the number occurrences of patterns of words on the Internet, from which it determines some patterns of words are more probable than others, e.g.

The number of occurrences, and thus probability of
“The cat sat on the mat” is greater than “The cat sats on the mat”.
From examples like this, **GPT learns grammar**.

The number of occurrences, and thus probability of
“The cat sat on the mat” is greater than “The whale sat on the mat”.
From examples like this, **GPT learns world knowledge**.

The number of occurrences, and thus probability of
“2 + 2 = 4” is greater than “2 + 2 = 5”.
From examples like this, **GPT learns math**.

Source: Deep Unsupervised Learning

As Transformers scale, greater levels of "intelligence" *emerge*.

The size of a model is measured by the number of parameters it has - the number of connections with its a neural network.

Researchers have discovered that training ever larger Transformer models on ever larger unstructured datasets helps these models learn new capabilities, such as the ability to summarize text or even create jokes. There is, in fact, **a predictable improvement in the emergent capabilities that Transformer models develop correlated with the size of the model**.

By some measures, building more "intelligent" models is simply a routine matter of building and training larger models, rather than writing tailored procedural programming code to have an algorithm support a new capability.

Larger models, however, are more costly to build. In 2021, Microsoft and NVIDIA introduced Megatron-Turing NLG 530B. With 530 billion parameters, this is one of the largest models trained to date. Microsoft and NVIDIA used hundreds of DGX A100 multi-GPU servers. With each server costing $199,000, the equipment alone cost over $100M. Factoring in the cost of talent and other resources, ***the cost of building a model is typically over $1Bn***.

The investment required means that only a few companies can justify building large models, with a plan to sell subscriptions for them so that a single model can be used by wider numbers of individuals and businesses.

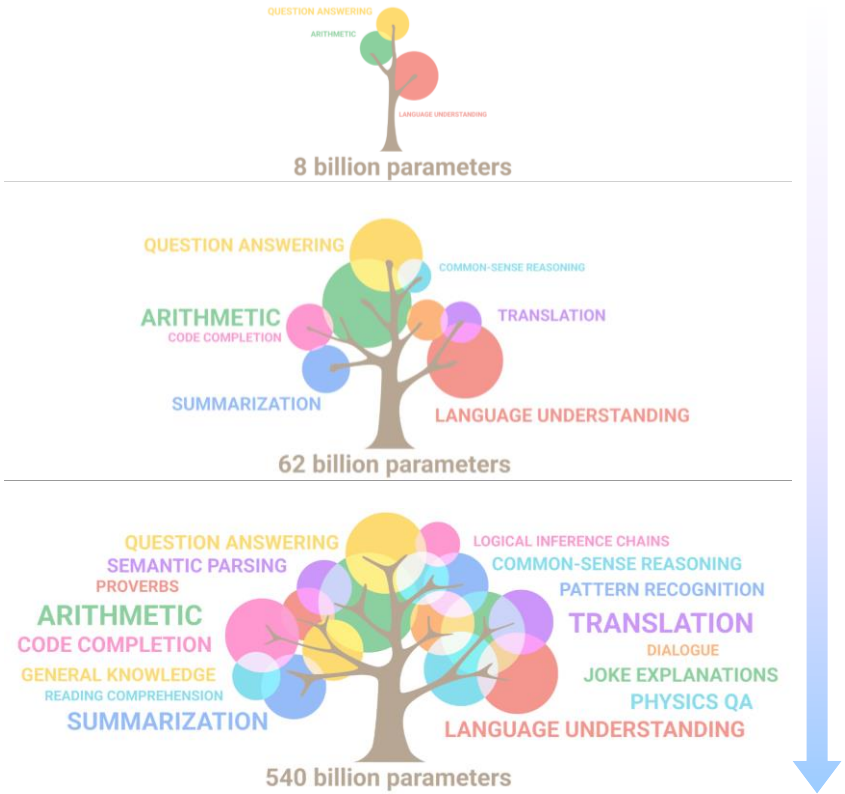


Figure. The growing capabilities of Google's PaLM model, as it scales. Source: GoogleResearch

Numerous Large Language Models (LLMs) are becoming available

LLMs are distinct in comparison to models of the past in that:

- LLMs can address a range of tasks, rather solving one particular use case (e.g. making recommendations).
- LLMs are often generative: rather than distilling input data to a specific output prediction, they can extrapolate from a given input prompt to create something new.

While large tech companies, such as Google, Meta and Amazon, have been developing LLMs, they are only starting to become widely available.

Currently three large organizations offer commercial access to their LLMs: Cohere, AI21labs and OpenAI. OpenAI is tightly partnered with Microsoft.

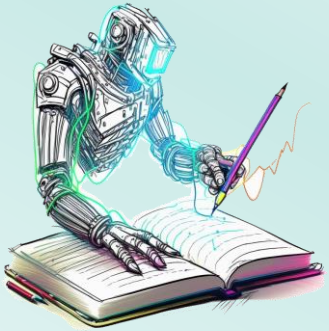
A number of open-source LLMs are also available, such as Blender Bot, DialoGPT, GODEL and BLOOM. These open-source LLMs would need to be deployed, hosted and potentially further trained for specific applications.

co:here AI21labs OpenAI

Organizations offering commercial access to their LLMs

Modality	Large Language Models (LLMs)
Text	GPT & ChatGPT (OpenAI) / Bing AI (Microsoft) Bard / LaMDA (Google) LLaMA (Meta)".
Speech Recognition	Whisper (OpenAI)
Image Generation	DALL-E 2 (OpenAI) Stable Diffusion Midjourney
Programming	Codex (OpenAI) / Github Copilot (Microsoft) Tabnine
Music	MusicLM (Google) Jukebox (OpenAI)
Video	Make-A-Video (Meta) Gen-1 (Runway)
3D Model Generation	DreamFusion (Google) NVidia GET3D

Figure. Notable Large Language Models (LLMs) currently available or in closed trials



An Industrial Revolution For Knowledge Jobs

Large Language Models (LLMs) are driving a new *Industrial Revolution*, transforming the essence of knowledge work from human-powered to machine-powered.

Prior to the Industrial Revolution, most economic activity in Western countries centered around family farms. The manufacture of goods was an artisanal craft.

From shoemaking to woodworking furniture, goods were hand-made on a small-scale. During the Industrial Revolution, these family farms and artisanal crafts gave way to larger, machine-powered manufacturing operations - bringing about new industries, supply chains, jobs and the wide availability of affordable goods.

Knowledge work is now on the verge of succumbing to larger, machine-powered operations in much the same way family farms and artisanal crafts did before it. From handcrafted marketing emails, to redlining legal contracts, knowledge work is the artisanal-like activity of our era.

LLM based AI tools are the large machine-powered operations for knowledge work. In the next decade, organizations will increasingly utilize these tools in lieu of hiring knowledge workers. In the meanwhile, just as jobs were created in support of the machines that manufacture clothes and other goods, new jobs will be created to support the machines that manufacture knowledge based outputs.

The impact of LLMs on knowledge work is similar to the impact of the Industrial Revolution on the manufacture of physical goods.

The Impact	The Industrial Revolution	The Knowledge Work Revolution
Automation The replacement of manual labor with machine labor, increasing productivity	Tools and machinery substantially increased productivity. For example, agricultural yields on farms were boosted by the invention of the seed drill developed by Jethro Tull around 1701.	AI tools enabled by LLMs are creating "first drafts" of many knowledge products typically created by entry level roles. These range from programming code to blog articles. Those holding these jobs are transitioning from creators to becoming editors, boosting their productivity.
Centralization The centralization of production in large factories.	Mechanized factories, providing centralized production at large scale, started producing goods at lower cost than could be done in small artisanal shops.	Scaled up "knowledge factories", for fields ranging from law to finance, are likely to centralize production of knowledge-based deliverables and reduce costs.
Abundance The wide availability of mass-manufactured goods.	Artisans were limited in the amount of goods they could create based on available human and animal muscle. Mass manufacturing made goods more affordable and accessible to a wider range of people.	Many knowledge based services, such as 1-on-1 tutoring or medical advice, require human labor. AI based products will substitute the need for human labor in delivering these services. This will bring down costs and make these services more widely available.
New jobs New types of jobs in support of a new economy.	New jobs in manufacturing were created to support factories, while many traditional jobs in farming were eliminated.	New jobs supporting factories that create knowledge products are being created, while the number of traditional knowledge work jobs is likely to reduce in number.

LLM applications are already doing for knowledge and content tasks what Excel has done for math-based tasks.

***In cases where the Internet has a wide range of examples of the content that needs to be created**, and the AI models do not need a lot of input context – in terms of situational or organizational information unique to do the task – LLM based applications are already being used to augment production in language-centric jobs, in the same way Excel's formula and pivot tables have done for math-centric jobs.*

Many of these LLM applications are free or low cost to implement and are gaining grass-roots adoption within organizations.

- JasperAI, Writesonic and ChatGPT create blog posts, newsletters and other marketing content
- Github Copilot users report, on average, having the tool write over 40% of their code
- Midjourney, DALL-E 2, Stable Diffusion and other art generation tools are being used by artists to create concepts and drafts for discussion with clients, before working on a final draft.

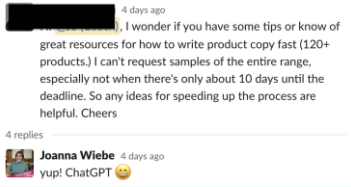
Users of these tools say they are better able to focus more more strategic elements of their work, with some of the drudgery of their work now done by the AI.

In cases where the Internet does not have examples of the content that needs to be created, meaning LLMs are not inherently trained on those examples, organizations will - over the coming years - integrate LLMs into their existing applications to create content to their use case.

Copywriting 120+ product descriptions in hours, not weeks.

Joanna Wiebe, creator of Copyhackers, shares how ChatGPT is amplifying the productivity of copywriters:

Last week, I got this question during office hours:

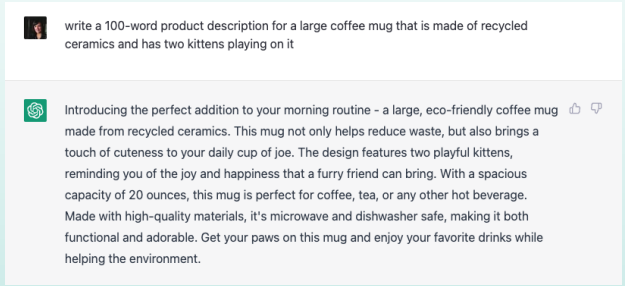


The freelancer in question had 120+ product descriptions to write.

And no time.

My reply was unsurprising to those who've been around me lately. You can see my exclamation- and emoji-filled reply ^^ there. The answer was ChatGPT.

I showed her the product description it wrote for me in just 20 seconds:



Source: Copyhackers Feb 16th 2023 newsletter

As they grow in popularity, LLMs will become factories that dominate previously fragmented professions.

Beyond piecemeal automations of certain parts of existing jobs, a number of startups and companies are working on providing AI applications that take on greater wholesale responsibilities of jobs.

- **Google's Contact Center AI** provides virtual agents for customer service centers. HomeServe's implementation of the AI application processes 11,400 calls a day. Its functions include routing calls to appropriate departments, processing claims and scheduling repair appointments.
- **Speak.AI's** goal is to make language tutoring available to all. The company has launched its application in South Korea, where there is high demand for English tutoring, and plans to expand to other countries in Asia.
- **Designs.AI** let users develop logos, videos, websites or a new brand in a few minutes.

As individuals and organizations come to rely on tools such as these, the capabilities of these tools improve, leading to them becoming even more popular – ultimately becoming centralized factories of knowledge work for the specific fields they serve.

The Centralization of Legal Work

Harvey AI automates and improves various aspects of legal work, such as

- contract analysis
- due diligence
- litigation
- regulatory compliance.

Harvey.
Unprecedented legal AI

ALLEN & OVERY

Built on OpenAI's GPT technology, Harvey AI has partnered with Allen & Overy (A&O), one of the world's largest law firms.

"I have been at the forefront of legal tech for 15 years, but I have never seen anything like Harvey. It is a game-changer that can unleash the power of generative AI to transform the legal industry."

David Wakeling, Head of the Markets Innovation Group at Allen & Overy.

Since November 2022, over 3,500 lawyers at A&O have already tested Harvey.

Harvey builds a specific AI model for each law firm, which is used to make their model unique based on feedback from their attorneys. Harvey is positioned to be similar to a Tier 2 supplier in manufacturing.

Source: Law.com

LLM factories reduce the cost of knowledge-based services and products, making them more widely available.

With the emergence of highly optimized and automated knowledge factories, costs falls. Knowledge based products and services that are currently cost prohibitive are becoming available to more people and organizations.

- **Personalized 1-on-1 education** is becoming more commonplace. Walden University has partnered with Google Cloud to launch Julian, an interactive chat-style tutor. According to Steven Tom, Chief Transformation Officer at Walden, "this tool will allow [the university] to provide personalized instruction at scale to meet the needs and lives of adult learners."
- **Greater access to medical advice.** The World Health Organization estimates a projected shortfall of 10 million health workers by 2030, mostly in low- and lower-middle income countries. AI based tools may help fill some of the shortfall. Google, for example, has developed Med-PaLM, an LLM that answers medical questions. In one study, Med-PaLM responses matched the answers provided by clinicians 92.6 percent of the time.
- **Universal translation for all:** The original application for which the Transformer architecture was created is now widely used by Google and others, making translation from one language to another quick and accurate, without the need for expensive human translators.

These are just some of the first knowledge-based products and services that LLMs are commoditizing and making more widely available.

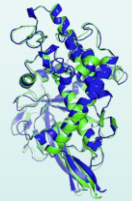
Accelerated drug discovery, through AlphaFold

Every important activity that happens inside every living thing involves proteins. The function of a protein is related to its shape. Proteins fold into 3D shapes, based on their known linear sequence of amino acids. Knowing these shapes is what allows scientists to find potential medicines that can bind to the targeted proteins. However, proteins can fold into 10^300 different possible 3D configurations.

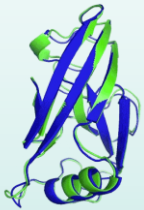
Traditionally, protein structures were discovered, over decades, through painstakingly tedious experimental methods, such as X-ray crystallography and nuclear magnetic resonance, using multi-million-dollar equipment.

Built on the principles of LLMs, such as the Transformer model, Alphafold is an AI model for protein folding - predicting the 3D shapes of proteins. Of the roughly 20,000 proteins in the human body, AlphaFold has taken the number of 3D structures known from 17% to virtually all (98.5%) of the human proteome. Of these, 36% are predicted with very high accuracy and another 22% are predicted with high accuracy.

AlphaFold dramatically cuts the costs of one step in the drug discovery process. This in turn lowers the barrier for new companies to participate in drug discovery.



T1037 / 6vr4
90.7 GDT
(RNA polymerase domain)



T1049 / 6y4f
93.3 GDT
(adhesin tip)

AlphaFold's predicted structures are comparable against those discovered via more costly experimental methods.

- Experimental result
- Computational prediction

Source: Deepmind.com

To run the new LLM factories, new professions are emerging.

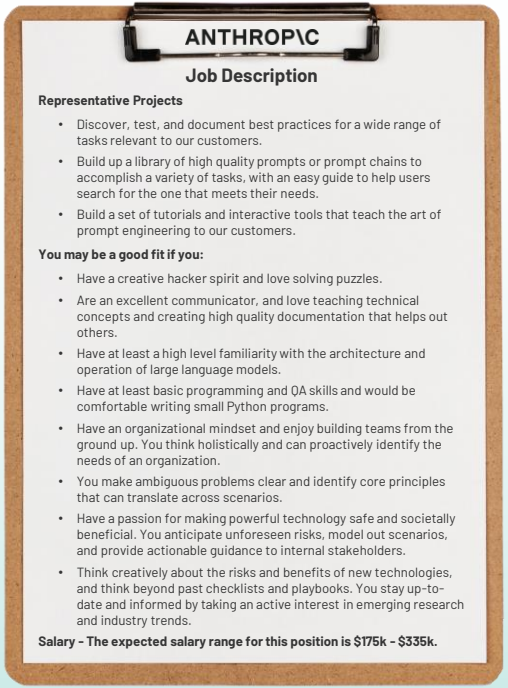
During the Industrial Revolution, clothes making shifted from rural families who performed spinning and weaving tasks in their homes to a large, mechanized, factories. In this transition, new knowledge work jobs were created - from clothes designers, to contract lawyers to copywriters - while the manufacture of clothing became automated. In this new Knowledge Revolution, two examples jobs gaining in importance are:

- **Data Labelers / AI Trainers.** While unsupervised learning has allowed for big breakthroughs, such as training the GPT model, supervised training has still been necessary. For example, in the creation of ChatGPT, the base GPT model needed to be trained with further task-specific data to have it behave as a chatbot. The job of data labelers is to create task specific input/output data. While this may seem like a simple task, tens - if not hundreds - of thousands of data-points are required, making this one of the most tedious, but also most important, parts of building the behaviors of an AI model.
- **Prompt engineers** - also called "AI whisperers" - are professionals who specialize in writing prose, or other inputs, to test LLMs. Because the capabilities of LLMs are emergent - i.e. they are not known until after the LLM is trained - prompt engineers are necessary to help uncover the hidden capabilities of LLMs.

These new jobs support the research, design, development, scaling and maintenance of the new LLM machines, though not necessarily with a direct 1-to-1 match to similar jobs in manufacturing.

Prompt Engineer: The Hottest New Job In AI.

Anthropic - an AI firm backed by Google - is hiring Prompt Engineers for $175k to $335k + equity. No computer science degree is required.



ANTHROP\C

Job Description

Representative Projects

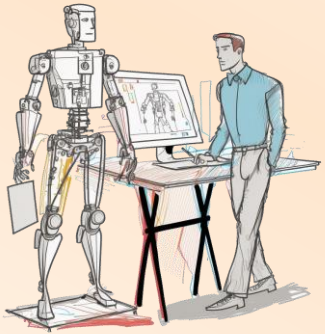
- Discover, test, and document best practices for a wide range of tasks relevant to our customers.
- Build up a library of high quality prompts or prompt chains to accomplish a variety of tasks, with an easy guide to help users search for the one that meets their needs.
- Build a set of tutorials and interactive tools that teach the art of prompt engineering to our customers.

You may be a good fit if you:

- Have a creative hacker spirit and love solving puzzles.
- Are an excellent communicator, and love teaching technical concepts and creating high quality documentation that helps out others.
- Have at least a high level familiarity with the architecture and operation of large language models.
- Have at least basic programming and QA skills and would be comfortable writing small Python programs.
- Have an organizational mindset and enjoy building teams from the ground up. You think holistically and can proactively identify the needs of an organization.
- You make ambiguous problems clear and identify core principles that can translate across scenarios.
- Have a passion for making powerful technology safe and societally beneficial. You anticipate unforeseen risks, model out scenarios, and provide actionable guidance to internal stakeholders.
- Think creatively about the risks and benefits of new technologies, and think beyond past checklists and playbooks. You stay up-to-date and informed by taking an active interest in emerging research and industry trends.

Salary - The expected salary range for this position is $175k - $335k.

Source: Anthropic Jobs



Organizations can start preparing for the *knowledge revolution* by taking two steps.

LLMs are not self-directed. They need to be given direction on what they should generate. As a consequence, people who become skilled at working with LLMs will be able to enhance their productivity and increase their value to organizations. Similarly, organizations with staff that are trained and capable of taking advantage of LLMs will gain cost advantages.

Organizations can start preparing by

- **1. Making adoption of LLMs a priority.** In many organizations, pockets of staff have started experimenting with ChatGPT. To find the right best prompts to assist with a particular job task takes iteration. However, what individual staff learn is not shared across others in the organization with similar roles. Organizations benefit from more systematically identifying prompts and training staff on them.
- **2. Keeping up with new applications of LLMs.** So long as there is a way to represent something with a structure that is similar to a language, together with data sets to train on, Transformer-based large models can learn the rules and then translate between the input and output "languages". The input/output forms can take any shape, from textual instructions generating automations on a spreadsheet, to complex stock trading indicators, generating YouTube videos, for example. The flexibility of Transformer models open them up to a wide range of future applications within industry. We highlight some of these.

“AI literate” staff that can work with AI will become more valuable to organizations.

As organizations make adoption of LLM technology a priority, and determine how it can boost productivity, they will need to consider redesigning existing jobs. One such adaption is the “sandwich” workflow becoming dominant in knowledge work.

1. *First, a human has a creative impulse, and gives the AI a prompt. (Bread)*
2. *The AI then generates a menu of options. (Fillings)*
3. *The human chooses an option, edits it, and adds any touches they like. (Bread)*

Source: NoahOpinion

Because people prefer to communicate with other people, many jobs may trend towards communication with other humans, with the mechanics of how tasks are completed is assumed by LLMs.

Organizations may also designate specific roles for exploring and standardizing the use of LLMs, in the same way that IT departments have emerged since the 1990s to take on the role of implementing and managing computing technology.

MIT Study: ChatGPT reduces time taken on tasks by 40% and improves quality by 20%

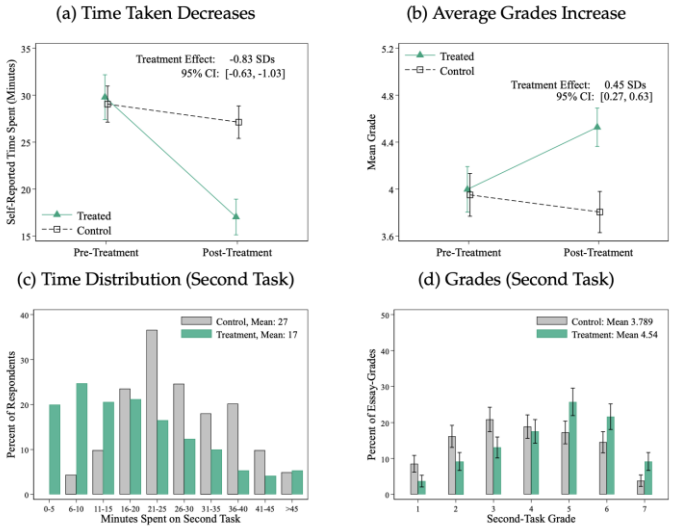
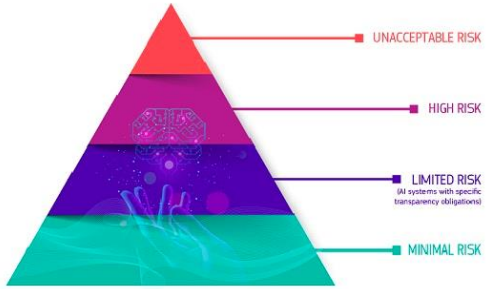


Figure. In a study involving 444 college-educated professionals who were assigned occupation-specific writing tasks, half of them were randomly exposed to ChatGPT. The findings were remarkable, as ChatGPT led to a significant increase in average productivity, reducing the time taken by 0.8 standard deviations (about 44%) and enhancing the output quality by 0.4 standard deviations (approximately 22%). Source: Economics.mit.edu

In using LLMs, organizations will need to also consider the wider societal discussions related to AI technology.

These include:

- **Biases.** Beyond factual inaccuracies that the GPT model trained on Internet data may be prone to, some argue that Internet content is biased towards the views of Western men.
- **Environmental Impact.** Because LLMs are computationally intensive, concerns have been raised about the environmental impact of the data centers used to run these LLMs, as usage of them grows.
- **Regulation.** The EU has proposed legislation to regulate the development of "standalone AI" models, to ensure their safety to the public. This includes provisions to make AI models more explainable. It can be almost impossible to determine why an AI model produced the output it did for a given input. This regulation may impact the architecture of AI models, to ensure it is possible to understand how AI models arrive at their outputs, so that problematic or unfair reasoning in AI models can be corrected.
- **Rate limiters to progress:** Though AI may be a productivity multiplier, there may be other elements of a system that prevent that productivity being realized. For example, AI systems could enable faster drug discovery. However, those drugs still need to run though human trials, which is a slow process.



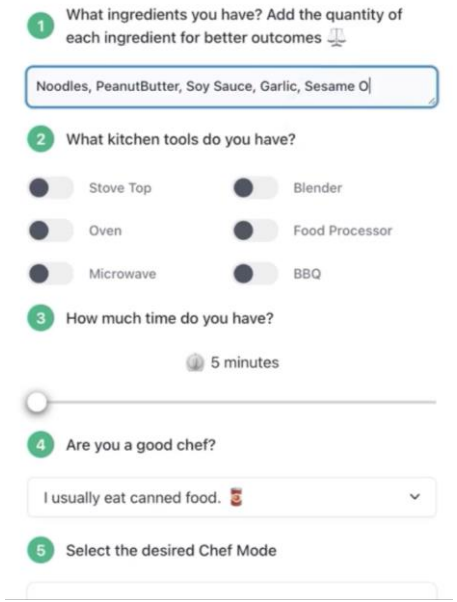
Category	Definition	Resolution
Unacceptable risk	All AI systems considered a clear threat to the safety, livelihoods and rights of people will be banned.	Banned.
High risk	Critical infrastructures and those affecting the economic opportunities of people (e.g. CV-sorting software, exams).	Must show traceability of results, use high quality datasets and have risk mitigation systems.
Limited risk	AI systems with specific transparency obligations.	Users should be aware that they are interacting with a machine.
Minimal or no risk	This includes applications such as AI-enabled video games or spam filters.	Free use of minimal-risk AI.

Figure. The EU's Proposed Regulatory Framework. Source: European Commission

ChefGPT

ChefGPT: An AI-Powered Personal Chef

ChefGPT allows users to automatically generate recipes and meal plans based on their available ingredients and kitchen tools, health goals, and dietary requirements. It also offers the ability to find wine pairings and customize recipes based on specific macronutrient goals.

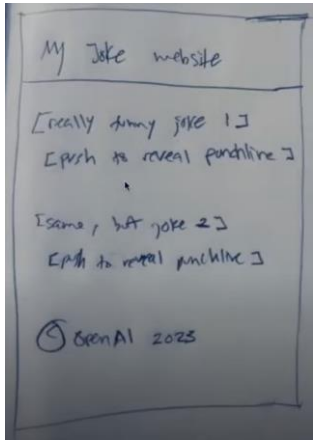


OpenAI

GPT4: OpenAI's latest LLM and update for ChatGPT

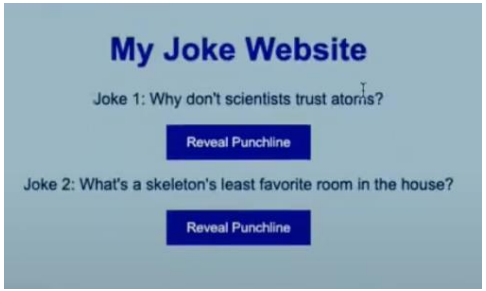
OpenAI's GPT4 can take both images and text as input to produce text outputs. The LLM is able to understand the different parts of images given to it, as well as the meaning behind those parts. The text given with the image can be used to instruct the LLM to reason about the image or generate other text outputs based on characteristics of the image.

Figure. OpenAI demo of GPT4 recognizing an image and inferring a hypothetical situation from the image.



GPT4 can take image content and make sense of it. In this example, it takes a sketch of a website and converts it into programming code that materializes it as an approximation of the intended website.

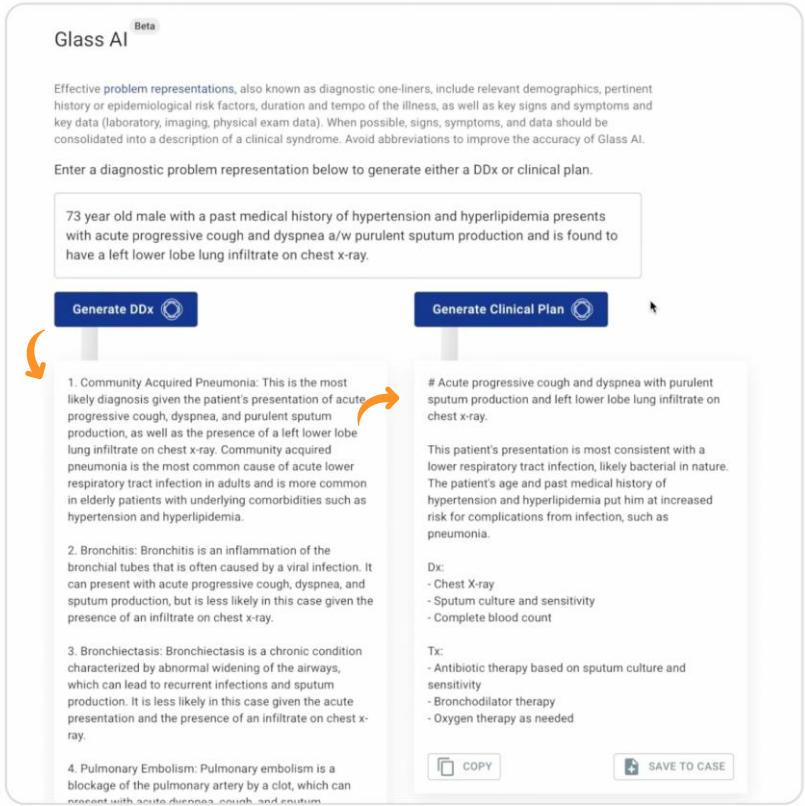
```
verything!";
        }
        function revealJoke2() {
            document.getElementById("jokeText").innerHTML = "Why did the chicken go to the seance? To get to the othe
r side!";
        }
    </script>
</body>
</html>
Submitting: [{'role': 'user', 'content': ['Write brief HTML/JS to turn this mock-up into a colorful website, where th
e jokes are replaced by two real jokes.', {'image': '...'}]}]
Response: <!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>My Joke Website</title>
    <style>
        body {
            background-color: lightblue;
```



GLASS

Glass: A platform for clinicians to build and maintain medical knowledge

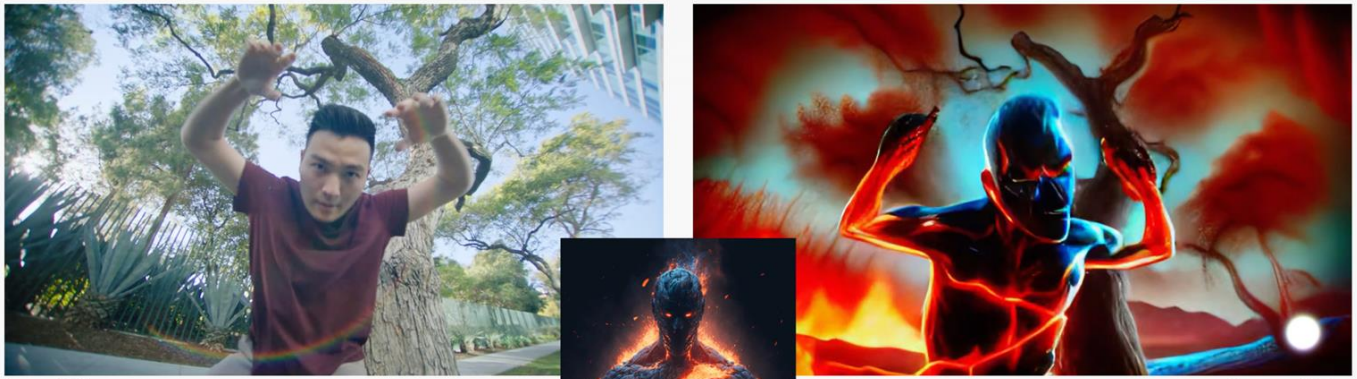
This AI powered platform is able to generate clinical plans based on diagnostics. The output is based on relevant demographics, pertinent history or epidemiological risk factors, duration and tempo of the illness, as well as key signs, symptoms and exam data.



GEN-1
runway

Gen-1: Hollywood style VFX transformations for videos

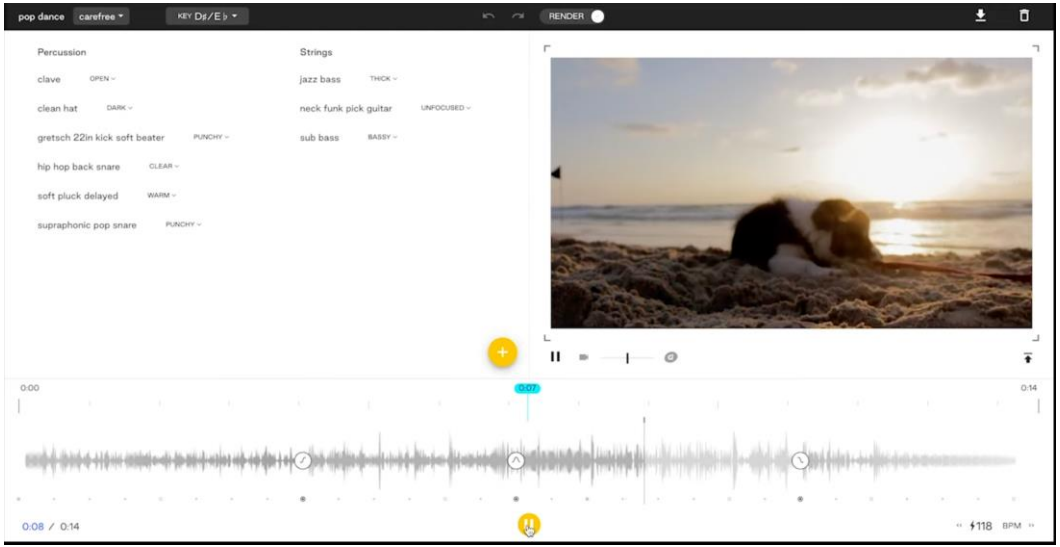
Gen-1 is an AI video generator LLM that generates video according to the requirements it is given. Unlike other video generators, it does not generate entirely new videos. Instead, it uses uploaded videos with specific texts or image prompts to apply various effects to those videos.



amper music

Amper: Generating music

Musical tracks are generated by Amper using pre-recorded samples that are converted into audio. These audio files can be customized using various parameters such as music keys, tempo and individual instruments. This allows the adjustment of the instruments to suit the desired mood or vibe. The company is now part of Shutterstock.



BioNeMo: Drug discovery

BioNeMo is a cloud-based drug discovery service and framework that utilizes NVIDIA's NeMo Megatron LLM to train and deploy large biomolecular transformer AI models on a supercomputing scale. Its capabilities are tailored to accommodate molecular data represented in both the SMILES notation for chemical structures and FASTA sequence strings for amino acids and nucleic acids.

Evozyne - a startup company - utilized a pretrained AI model from NVIDIA to develop proteins combating diseases and addressing climate change. Evozyne used NVIDIA's implementation of ProtT5, a transformer model featured in their BioNeMo platform.

In the same way that ChatGPT and other transformer models are trained, ProtT5 was trained on sequences of amino acids in countless proteins. The model then identified how to assemble novel proteins tailored to Evozyne's needs.

Compared to the traditional method of protein engineering, which uses a slow and often inefficient "directed evolution" approach to modify small portions of an amino acid sequence, Evozyne's process was able to alter over half of the amino acids in a single round, equivalent to hundreds of mutations.

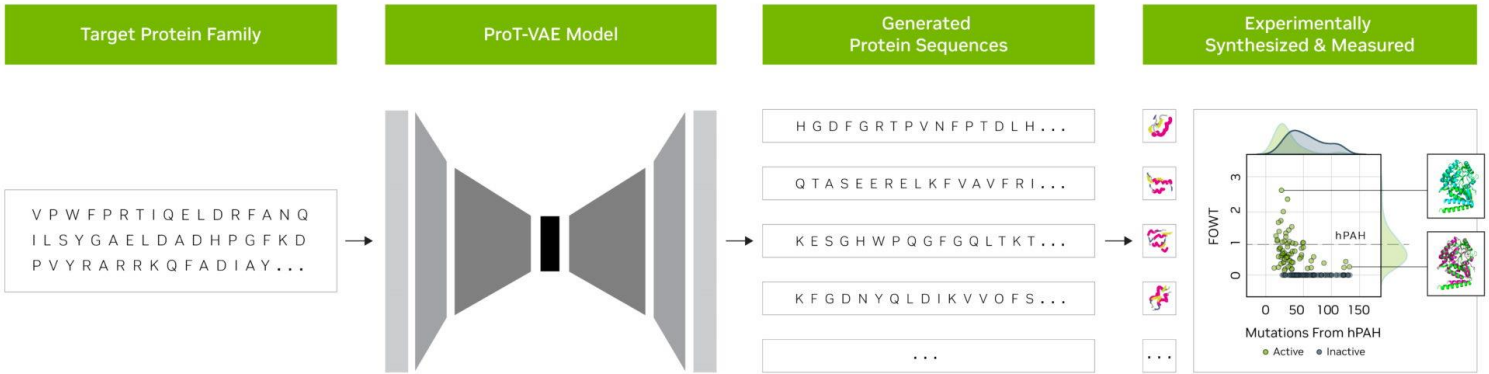


Figure. Evozyne's ProT-VAE process. Source: Nvidia Blog

Potential Next Steps

PreScouter can help you learn more about the ways in which ChatGPT and other Large Language Models (LLMs) are being put to use in your organization's job roles and industry.

PreScouter can help your organization put in place processes, systems and training for staff to best leverage the capabilities of Large Language Models (LLMs).

PreScouter can help your organization stay up-to-date with the latest developments in Large Language Models (LLMs) that are applicable to your workflows.

Engage with us at
ai@prescouter.com

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RESEARCH REPORTS CREATED

150,000+
HOURS OF RESEARCH COMPLETED FOR CLIENTS

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