

# Unravelling the AI Hype: Understanding the Journey of NLP to ChatGPT

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When the first passenger train ran in 1825, many believed that travelling at such great speeds would lead to a gruesome death, with limbs being torn off bodies, or bodies simply melting. Some 50 years later, Alexander Graham Bell was the subject of vicious attacks, with one writer for The New York Times predicting that use of the telephone would result in human beings soon becoming “nothing but transparent heaps of jelly to each other”. Many were equally afraid when electricity was being rolled out to homes, with US President Benjamin Harrison famously instructing his White House staff to switch the lights on and off for him lest he be electrocuted.

In 10 years, perhaps even less, we may consider the more extreme fears around artificial intelligence (AI) as far-fetched as these examples are.

Humans have always worried about the unknown changes that new technology may bring, as the hype around OpenAI’s ChatGPT most recently demonstrates. But here’s the thing: we have been using AI in our daily lives for years via predictive text on our cellphones, interacting with chatbots on websites and even through the spelling and grammar corrections made in word-processing programs. Natural language processing (NLP)-based AI like ChatGPT is also not new. In fact, the version of ChatGPT released in late 2022 was the consequence of three earlier iterations and was based on research dating back to the 1950s. ChatGPT only seems new because it was thrust into the hands of everyone, everywhere, all at once, leaving us to share the collective task of making sense of it.

History teaches us that fear of the unknown can be overcome with knowledge. So to make sense of the onslaught of NLP AI and overcome our fears, it is important to understand what it actually is, how it came about and what potential it holds.

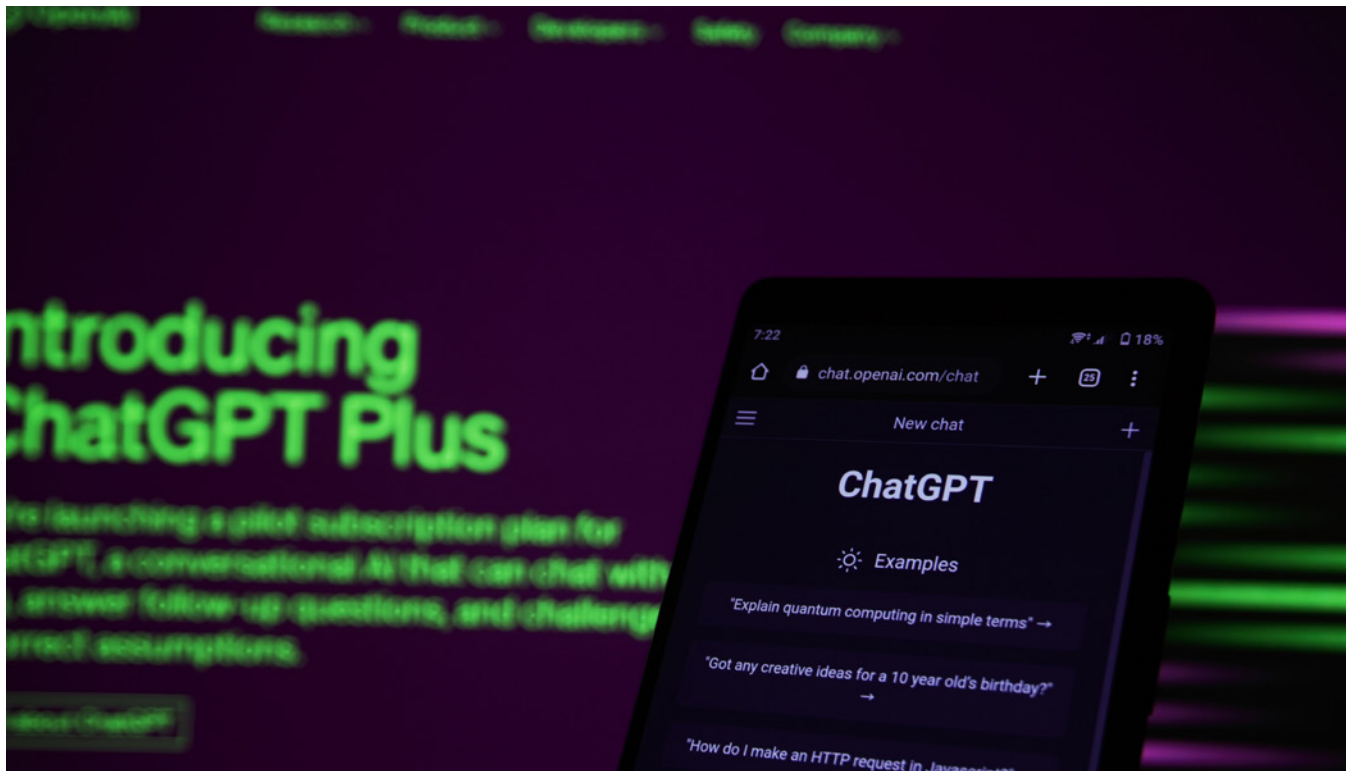
## A brief history of NLP

NLP is the study of how a computer and its binary brain can be programmed to understand the intricacies of human language. Easier said than done when every word we speak, no matter in what language or how simple, hides hundreds of shades of meaning within it, each subject to a multitude of rules that seem natural to native speakers.

This was the struggle early pioneers of NLP at the Massachusetts Institute of Technology (MIT) faced in the 1950s when they wanted to create a computer that could translate Russian into English. Their approach was much like going through a dictionary, replacing each Russian word as it came and fitting it to English’s word-ordering. Anyone who’s ever struggled through a beginner’s class in a new language knows this is a losing strategy.

The next wave of NLP, lasting through the 60s, 70s and early 80s, was built on the back of advances in linguistic theory, most notably the contributions of Noam Chomsky and his theory of generative grammar. The idea that language had consistent structures, following rules and hierarchies just like computational languages, gave NLP researchers hope that the ambiguities of simple sentences could be resolved by identifying and manually coding all these rules. But this too proved unfeasible. There were too many esoteric rules, too many exceptions, and not enough computational power to get close. Just settling on the meaning of any given word in an automated way seemed impossible.

This hard-won lesson led to the next wave of NLP, which started in the late 80s. The seeds of GPT were planted by the realisation that sophisticated algorithms could create a statistical model of semantics.



To cut many long years of research short, algorithms were eventually trained to convert English sentences into formal logic, to break down parts of speech and hierarchical roles, and to identify actors and the actions between them (effectively emulating human conversation).

In the early 2000s, this formed the basis of the large language modelling (LLM) that powers ChatGPT and others of its ilk, such as BERT, Chinchilla, Gopher, Bloom, PaLM and LAMDA. LLM's great leap forward is the idea that by teaching an algorithm to look at the first few words of a sentence and then guess what the next words will be, all the tricky, impossible-to-articulate rules will be learned automatically. This is much like an infant learning to talk by mimicking her parents and receiving the reward of being understood.

The current version of ChatGPT that has wowed the world is, essentially, a very sophisticated statistical model capable of both understanding and generating human-like language.

### The potential of LLM

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LLM-based AI is already being used in retail and commerce in the form of customer-experience-enhancing tools such as chatbots and in business operations for various automations.

The legal industry is embracing LLM's ability to sift through and intelligently analyse reams of paperwork, while the financial services industry is using this type of AI for a range of functions, from elevating customer service to analysing vast amounts of data and pinpointing risks.

In healthcare, LLM-based AI can be used to improve value-based care by evaluating medical records, providing potential diagnosis, educating patients on pathways to health, monitoring patients and providing real-time alerts and analysing scientific research to help identify new drugs.



### Why invest in LLM?

The total value of AI start-ups escalated to \$48 billion in 2022, six times the sector's value in 2020, making it likely that AI companies will soon surpass the enterprise value of internet companies.

Demand for LLMs continues to soar within the AI investment sector, with the market expected to reach \$34.3 billion by 2026. Key players in the LLM market include tech giants like Google, Microsoft, Meta and Amazon, as well as start-ups like OpenAI and Hugging Face. Google's Pathways Language Model (PaLM) alone cost an estimated \$8m to train, providing some insight into the massive investments being pumped into LLM.

Support industries are also burgeoning alongside LLM, such as semi-conductors, chip manufacturing and cloud technologies.

South Africans can invest in the high potential LLM-based AI market by investing directly in the big players that are themselves investing heavily in this market, as well as by investing thematically in the key sectors driving LLM, such as chip manufacturing and cloud technology.

Sygnia's FAANG Plus Equity Fund has been strategically repositioned to invest in many of these big players and other AI-based investment opportunities. The fund is already delivering more than its fair share in returns for

early adopters. It's the 2022 Raging Bull Awards winner for Best (SA-Domiciled) Global Equity General Fund and, the fund was ranked 1st out of 99 funds in the ASISA Global Equity Category for 1 year performance (as at end May 2023).

As AI adoption accelerates exponentially, we are at a crossroads in human history. You, as an investor, have a choice to make: let fear stop you from riding the AI train or get on board before it gets too crowded.

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