



ChatGPT

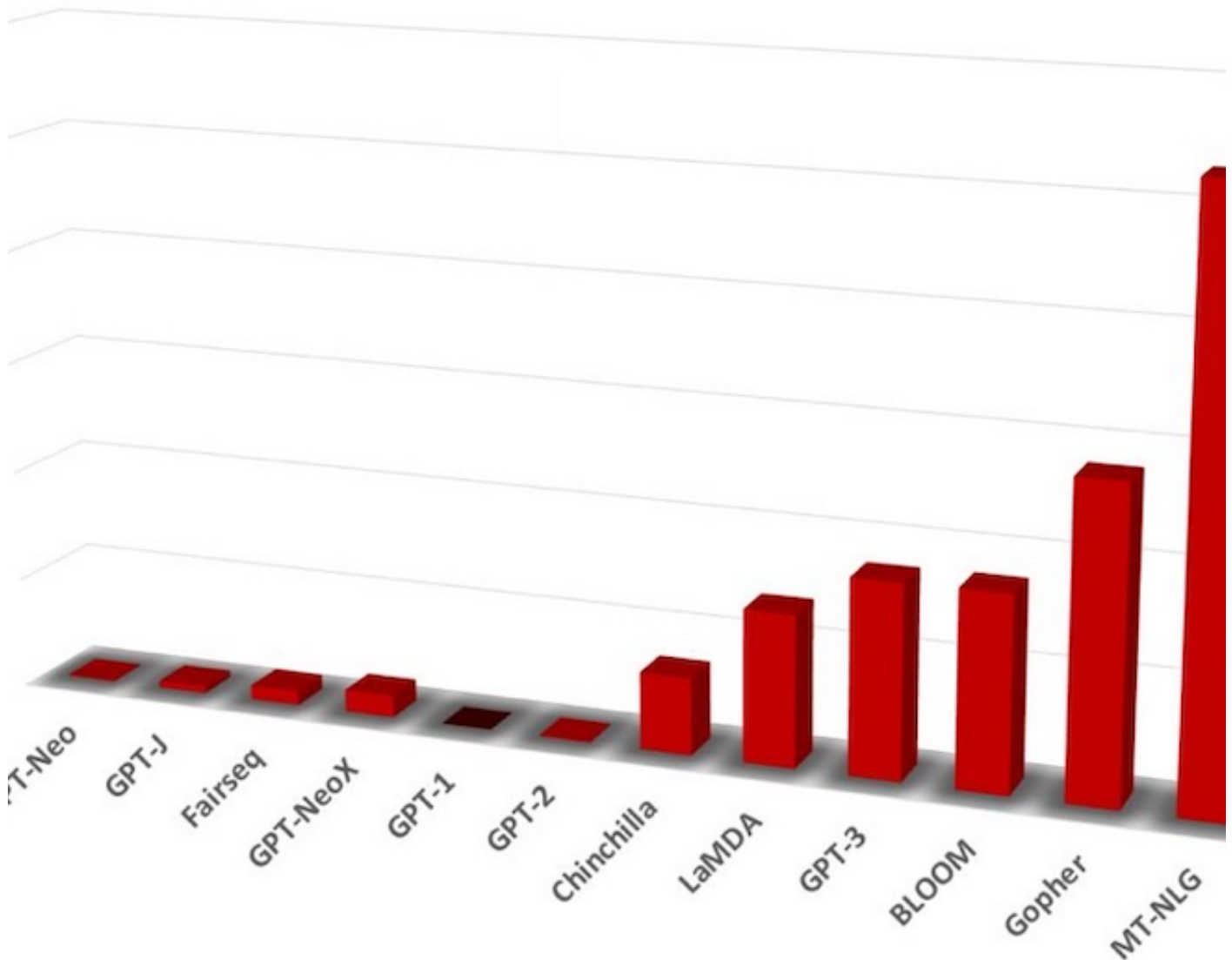


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What is it?

ChatGPT is a chat interface on top of the GPT 3.5 large language model – basically a chatbot. ChatGPT falls into the category of "Large Language Models." These models are trained on a large corpus of text to create billions of parameters for the model in an effort to make them able to understand human language and generate text about many topics.

Current Large Language Models



ChatGPT falls into the category of "Large Language Models." These models are trained on a large corpus of text to create billions of parameters for the model in an effort to make them able to understand human language and generate text about many topics. Below is a chart of the growing number of large language models and how many parameters they support, with GPT 4 on the horizon that is going after 1 trillion parameters.

Examples of other language model tools primarily using natural language

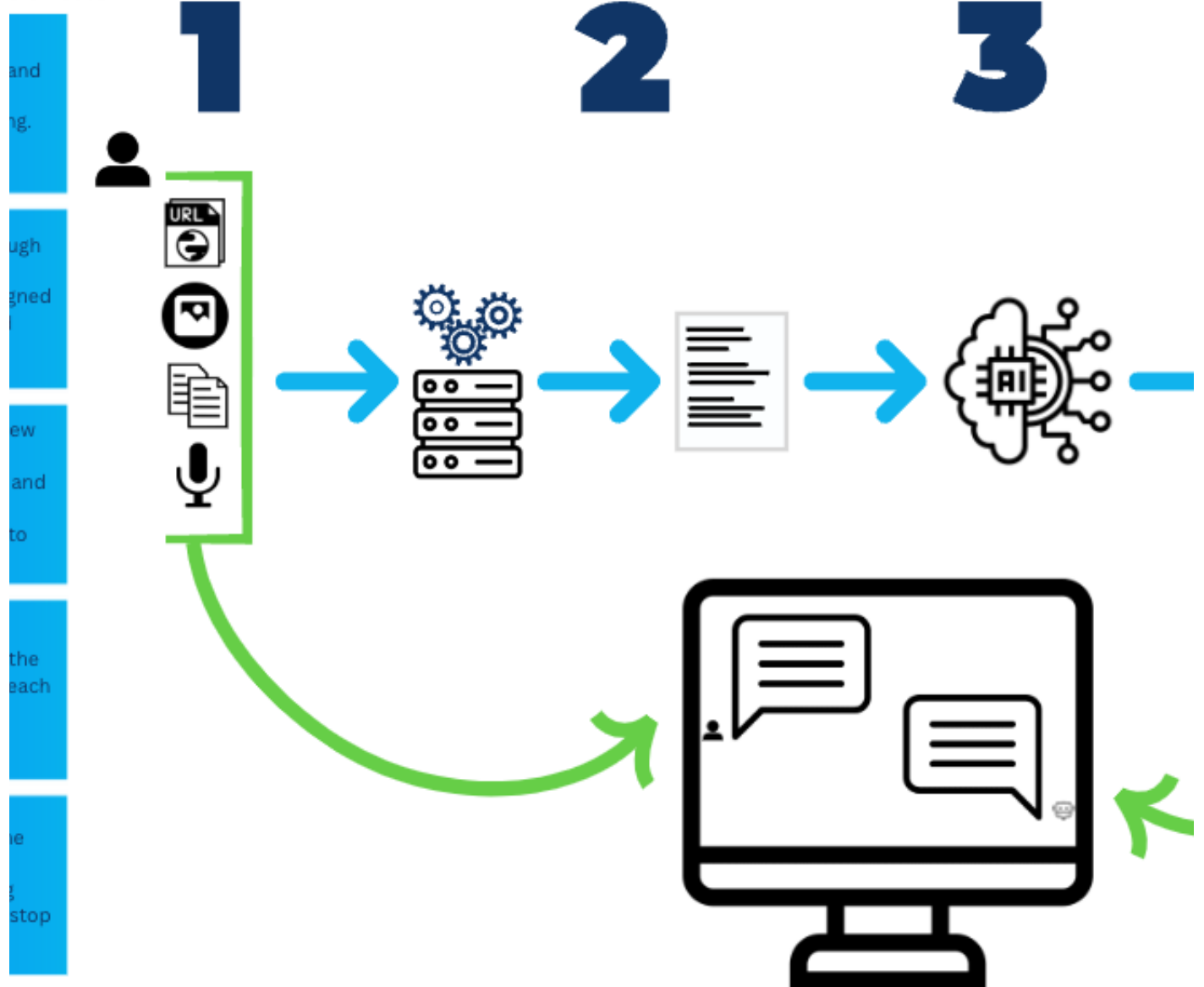
processing (NLP) include Siri, [Alexa](#), and [Grammarly](#). Similar tools to ChatGPT include [HyperWrite](#), [AI-Writer](#), [Google Bert](#), and [Microsoft Transformer](#).

ChatGPT assists with text-related tasks such as content creation, translation and question answering. It can also help with technical tasks such as software (code) generation and generating human-like text for chatbots and virtual assistants. Its most popular use cases include documentation, research articles, explanations, ideas, and tutorials. Some unique use cases include providing cooking recipes when prompted with a set of ingredients from your pantry or providing poems for your significant other's birthday card, or even lyrics to a new song.

How does it Work?

Works

ne user, a small
new text. The
the model.



ChatGPT starts with a model that was trained by OpenAI.com, the creators of ChatGPT. This uses technology known as Natural Language Processing (NLP).

In terms of the Artificial Intelligence definition of sense, think, and act, the AI senses the input prompt (Step 1 in the diagram), the ability to understand the prompt and predict / generate words is the thinking (Step 2), and the creating of

text and formatting is the act (Steps 3-5).

It is important to note that ChatGPT learns patterns in the text without being explicitly told what those patterns are.

For example, see the input below and ChatGPT's response. Notice that the language is not specialized or technical. Also, ChatGPT was able to understand that there were several parts to the request including coming up with a joke as requested.

ing an article about you and all of the cool things you can
say hello to my readers and give us a quick self-introduc
e friendly and casual, include a silly joke, and end with a r
great the rest of my article is.

ers! My name is Assistant, and I'm a large language mode
OpenAI. I'm here to help answer your questions and prov
nation on a wide variety of topics. I'm a bit of a jokester, s
quick one for you: Why was the math book sad? Because it
problems! But seriously, I'm excited to be featured in your
you enjoy learning more about me and all the cool things
ust me, the rest of the article is going to be great!

Estimates of how much it costs to operate ChatGPT run to \$100,000 a day which gives some idea of why a business would want a shared resource rather than build its own technology.

Limitations

While ChatGPT has many positive features, it also has many limitations which prevent it from adoption in business settings:

- **Easily Overwhelmed**– being able to access and use GPT is often unreliable. Most of the time, you are hit with an error message that says "ChatGPT is at capacity right now" and gives you the option to be notified when it is back up and running.
- **Incorrect Answers** – ChatGPT can provide convincing, yet incorrect answers. This would require a lot of fact-checking to rely on the results
- **Lack of Transparency** – unlike Google which gives links to pages that might be related to your query, ChatGPT only remembers how to predict the data, not the reason for the answer.
- **Knowledge Ends in 2021** – It doesn't know about anything after 2021 because its training ended in September of 2021. It doesn't have your unique data and there is no easy way to add to ChatGPT's training (such as tax rules) The error message from ChatGPT states that "My training data was collected and used to create my programming before September 2021. I do not have access to new information or updates since that time and my knowledge is based on the data available at the anything after 2021 because its training ended in September time of my training."
- **There is no business version** – there is no guarantee of continued access, there is no support or help desk, and there is no easy way to integrated it into your business or products since it only provides for chat – no APIs or other integration methods

Because of these limitations, ChatGPT is not ready for adoption by businesses. However, given the interest, these limitations will likely be addressed by Microsoft and its recent large investment in OpenAI.

What are other companies doing with these capabilities (including competition)?

Gartner recently shared that enterprise customers are exploring the possibilities to leverage GPT but have not seen any enterprises use ChatGPT directly. This is also found when analyzing our competitors, as none were found to be working with ChatGPT specifically now or any other large language model. With that said, it is important to note that Microsoft has announced its integration of Azure with OpenAI and has begun offering integrated services. View the [Azure and OpenAI Integration page](#) more information.

What has Vertex explored with this technology?

Vertex's emerging technology department has recently conducted an experiment using ChatGPT and other similar AIs (Artificial Intelligence) to write content. We compared the content to human-generated content on the same topic. We then analyzed each looking for creativity, plagiarism, grammar, spelling, word choice, content, and accuracy. The most significant negative was that the AI-generated documents were highly plagiarized and often inaccurate. This could cost the company time as the researchers need to "fact-check" the AI's work and ensure that the sources were appropriately added.

This experiment showed that while the human-generated article was found to be 100% original, ChatGPT's article was 17% plagiarized, while HyperWrite and AI-Writer were 4% and 10%, respectively. The human-generated and ChatGPT's articles were found to have above-average vocabulary while HyperWrite and AI-Writer were both below-average. Vertex also experimented with ChatGPT's coding capabilities. The code it produced worked well and was considered not perfect but good by our Software Architect.

What is the potential Intersection/Opportunity for Vertex?

ChatGPT has various potential uses for Vertex, including content creation, startup ideas, translation, app design, coding, text-related tasks, and automation.

- Content Creation and Comprehension- ChatGPT can assist with content creation in several ways, including text generation, summarizing, translation, answer generation, creative writing, content editing, and content optimization.
- Translation- ChatGPT can assist with translation in several ways, including text translation, context translation, real-time translation, document translation, language identification, post-editing the translations, and multilingual content creation.
- App design- ChatGPT can assist with wireframing and prototyping, user flow, UI/UX design, interaction design, accessibility, testing, and content creation. An example can be seen in the section titled More In-depth Technical examples.
- Coding- ChatGPT can help with coding in several ways, including code generation, code completion, error diagnosis, documentation, and API (Application Programming Interfaces) usage. An Example can be seen below:
- Text-related tasks- ChatGPT can assist with a wide range of text-related tasks, such as text generation, summarizing, question answering, keyword extraction, sentiment analysis, document classification, text completion, and spelling and grammar correction.

Next Steps

Integrating with ChatGPT or GPT is something that is still evolving, especially with the recent announcement of Azure's integration with OpenAi.

Integration could give us leverage in numerous areas of our business and lead to cost savings and increased efficiency. With that said, there are also numerous limitations that come with it that would need to be addressed.

It is important to note that integrating with Chat GPT would require integrating

with their API. More in-depth explanation of the next steps can be found below.

More In-depth Technical Examples

- **App design**- ChatGPT can assist with wireframing and prototyping, user flow, UI/UX design, interaction design, accessibility, testing, and content creation. An Example can be seen below:

Give me an app for young adults

Here is a basic concept for an app for young adults:



App Name: "FriendFinder"

Purpose: The app connects young adults in the same geographic area with similar interests. Users can create a profile, including information about their hobbies and activities, and browse through profiles of other users in the area. They can then message and connect with other users to make plans to hang out or join a group activity.

Features:

- User profiles with interests and hobbies
- Location-based browsing
- In-app messaging
- Group activity creation and join
- Push notifications for new matches and group activities

Design: The app would have a simple and user-friendly design, with a main feed displaying profiles of nearby users and tabs for browsing by interest and viewing messages. Users can easily update their profiles and search for other users through filters such as location and interests.

Conclusion: This is just one concept, of course, and can be adjusted according to your specific needs.

- **Coding**- ChatGPT can help with coding in several ways, including code generation, code completion, error diagnosis, documentation, and API (Application Programming Interfaces) usage. An Example can be seen

below:



How do I make an HTTP request in Javascript?



There are several ways to make an HTTP request in JavaScript, including using the `XMLHttpRequest` object, or more recently the `fetch()` API. Here is an example of making a GET request using `fetch()`:



Copy code

```
fetch('https://example.com')
  .then(response => response.text())
  .then(data => console.log(data))
  .catch(error => console.error(error));
```

You can also make a POST request with fetch:

Copy code

```
fetch('https://example.com', {
  method: 'POST',
  headers: {
    'Content-Type': 'application/json'
  },
  body: JSON.stringify({
    key: 'value'
  })
})
  .then(response => response.json())
  .then(data => console.log(data))
  .catch(error => console.error(error));
```

You can also use jQuery's ajax method to make HTTP requests in javascript.

```
$.ajax({
  url: "https://example.com",
  type: "POST",
  data: { key: "value" }
})
.done(function( data ) {
  console.log( "Data Loaded: " + data );
});
```

It's also worth to mention the axios library which you can use to make http requests.

```
axios.get('https://example.com')
  .then(response => {
    console.log(response.data);
  })
  .catch(error => {
    console.log(error);
  });
```

The `XMLHttpRequest` object is an older way of making HTTP requests in JavaScript and is supported by all major browsers, but it can be more verbose and complex than using `fetch()`.

In-Depth explanation of How ChatGPT works

ChatGPT works by receiving a prompt from the user, a small piece of text that the model uses to generate new text. The prompt serves as a seed or starting point for the model.

1. The model takes in the prompt and encodes it into a mathematical representation called embedding.
2. The embedding is passed through a series of layers called the encoder;

these layers are designed to understand the context and meaning of the input text.

3. Next, the decoder generates new text, word by word, using the information from the encoder and the probability distribution of words learned during training to predict the next word.
4. This process is repeated, with the model generating a new word each time and appending it to the previously generated text.
5. This process continues until the model reaches the maximum number of words or a stopping token (i.e., the user clicks the "stop generating" button).

It is important to note that ChatGPT learns patterns in the text without being explicitly told what those patterns are.

Step 1

Collect demonstration data and train a supervised policy.

A prompt is sampled from our prompt dataset.

A labeler demonstrates the desired output behavior.

This data is used to fine-tune GPT-3.5 with supervised learning.



Step 2

Collect comparison data and train a reward model.

A prompt and several model outputs are sampled.

A labeler ranks the outputs from best to worst.

This data is used to train our reward model.



Steps one would need to take in order to integrate with GPT:

1. Obtain access to the OpenAI API: This can be done by visiting the OpenAI website and applying for access to the API.
2. Familiarize yourself with the [API documentation](#): Once you have access to the API, you will need to review the documentation in order to understand how to make requests to the API and how to handle the responses.
3. Develop your application: Use the API documentation to develop your application, which will interact with the ChatGPT API to generate responses to user input.
4. Test your application: Test your application to ensure that it is working as

expected and that it is providing accurate and useful responses.

5. Deploy your application: Once you have tested your application and are satisfied with its performance, you can deploy it for use by your customers or clients.
6. Monitor and update your application: Continuously monitor your application to ensure that it is functioning properly and update it as needed to fix bugs or make improvements.

Resources

- <https://openai.com/blog/chatgpt/>
- <https://chat.openai.com/auth/login>
- <https://techcrunch.com/2023/01/11/openai-begins-piloting-chatgpt-professional-a-premium-version-of-its-viral-chatbot/>
- <https://www.businessinsider.com/everything-you-need-to-know-about-chat-gpt-2023-1>
- <https://www.investopedia.com/what-is-chatgpt-7094342>
- <https://www.pegasusone.com/how-chat-gpt-utilizes-the-advancements-in-artificial-intelligence-to-create-a-revolutionary-language-model/>
- <https://www.sciencefocus.com/future-technology/gpt-3/>
- <https://martechseries.com/mts-insights/staff-writers/9-things-to-know-about-chat-gpt/>
- <https://www.theinsaneapp.com/2022/12/facts-about-chatgpt.html>
- <https://www.analyticsinsight.net/top-10-interesting-facts-about-the-internets-favorite-chatgpt-you-should-know/>
- <https://emeritus.org/blog/ai-ml-what-is-chatgpt/#:~:text=Limitations%20in%20Training%20Data%20and,to%20training%20minority%20data%20groups>
- <https://www.sciencefocus.com/future-technology/gpt-3/>
- <https://azure.microsoft.com/en-us/products/cognitive-services/openai-service>

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