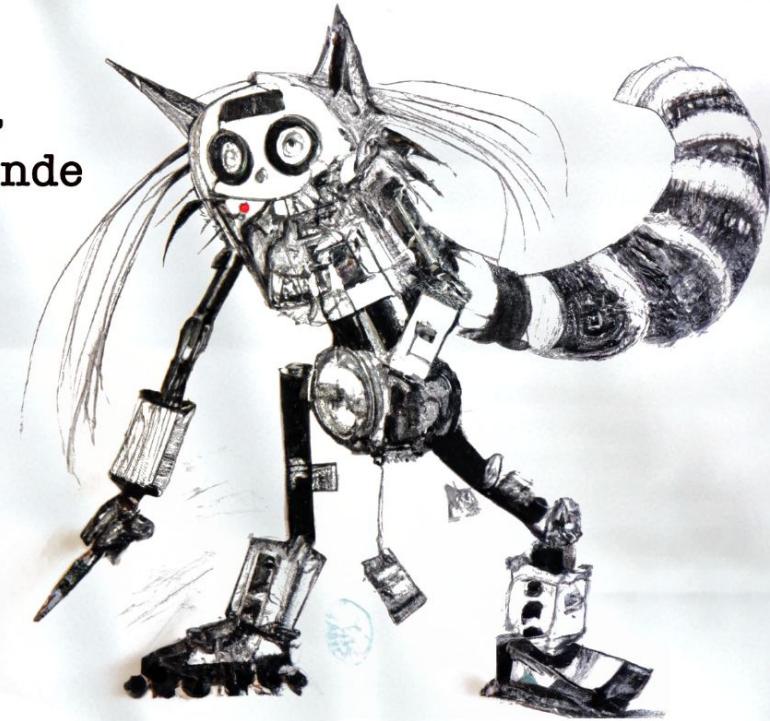


EAI + AI Skunkworks

AI Deep Dive - ChatGPT

Arjun Bhatia
Shesh Narayan Gupta
Tanvi Manohar Valkunde
Rishabh Indoria

March 7, 2023





EAI = Doing AI

**AI Skunkworks =
Learning AI by
Doing AI**

GitHub = aiskunks



Create your account

Please note that phone verification is required for signup. Your number will only be used to verify your identity for security purposes.

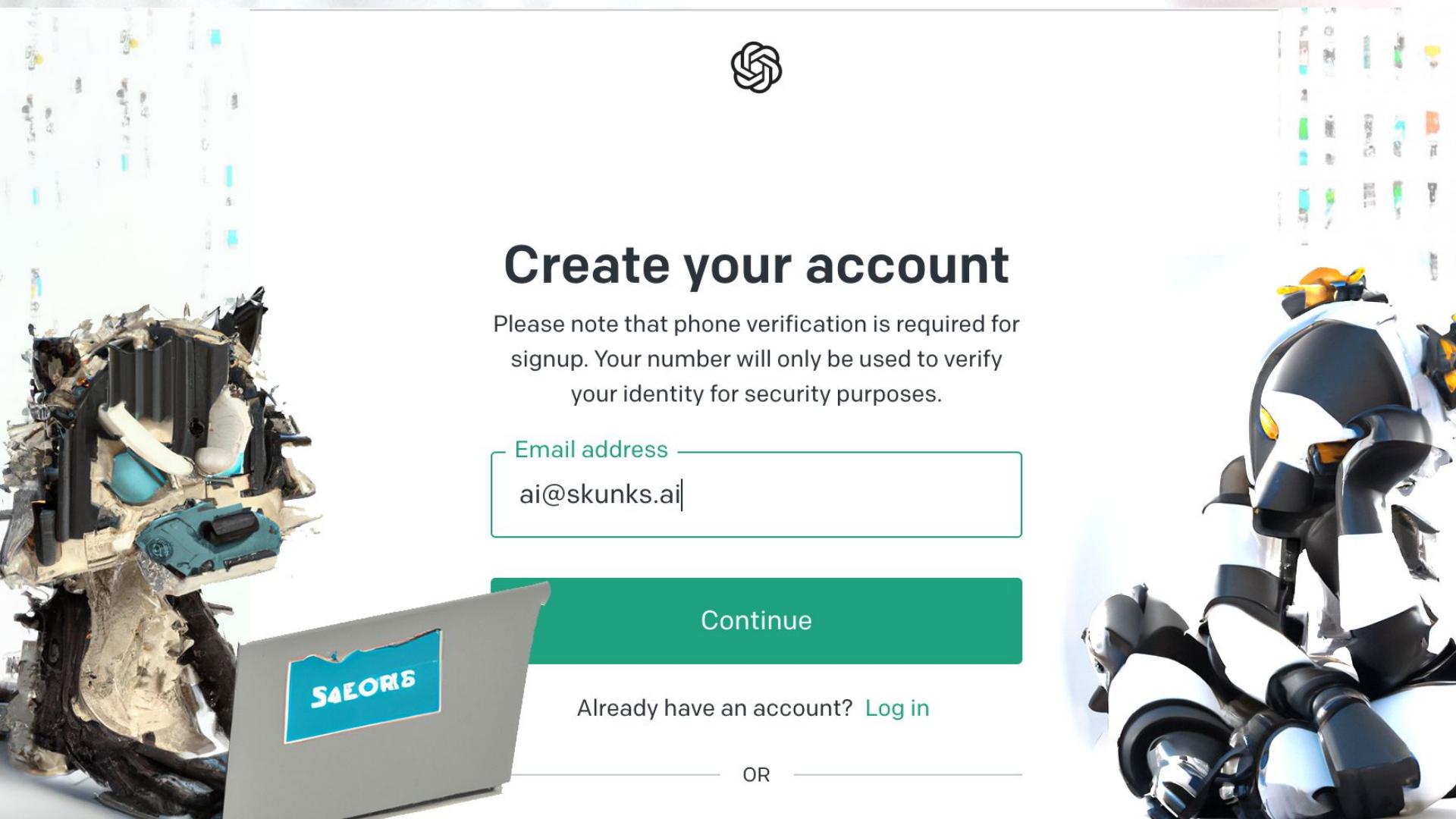
Email address

ai@skunks.ai

Continue

Already have an account? [Log in](#)

OR



ChatGPT: What's the Buzz all about??

FEB. 27 / MARCH 6, 2023

TIME

Hi ChatGPT

Hello! How can I assist you today?

What do you think of a TIME cover story with the title, "The AI Arms Race Is Changing Everything?"

As an AI language model, I don't have personal opinions or beliefs, but I can provide some context and information on the subject.

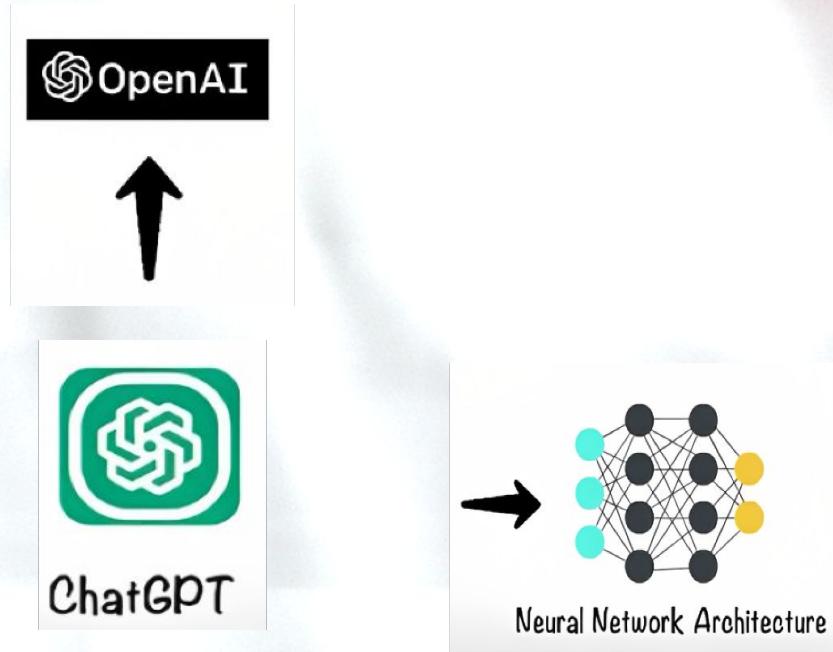
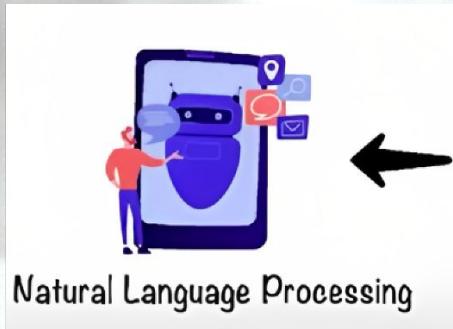
"The AI Arms Race is Changing Everything" could be an attention-grabbing and thought-provoking title for a cover story on AI. A cover story in a widely-read publication like TIME could help raise public awareness about the potential risks and benefits of this trend, and stimulate discussions on how to ensure that AI is developed and deployed in a responsible and ethical manner.

It's important to note that the title of the story could also be interpreted as sensationalist or alarmist, and may not accurately reflect the complexities ■

by
ANDREW R. CHOW
& BILLY PERRIGO
(humans)

time.com







ChatGPT

Examples	Capabilities	Limitations
"Explain quantum computing in simple terms" →	Remembers what user said earlier in the conversation	May occasionally generate incorrect information
"Got any creative ideas for a 10 year old's birthday?" →	Allows user to provide follow-up corrections	May occasionally produce harmful instructions or biased content
"How do I make an HTTP request in Javascript?" →	Trained to decline inappropriate requests	Limited knowledge of world and events after 2021

what is chat gpt



Evolution of Chat GPT - Models

GPT was first introduced in 2018 and has since evolved through several iterations, with each iteration becoming more powerful and having a larger model size. The evolution of GPT can be divided into three main stages:

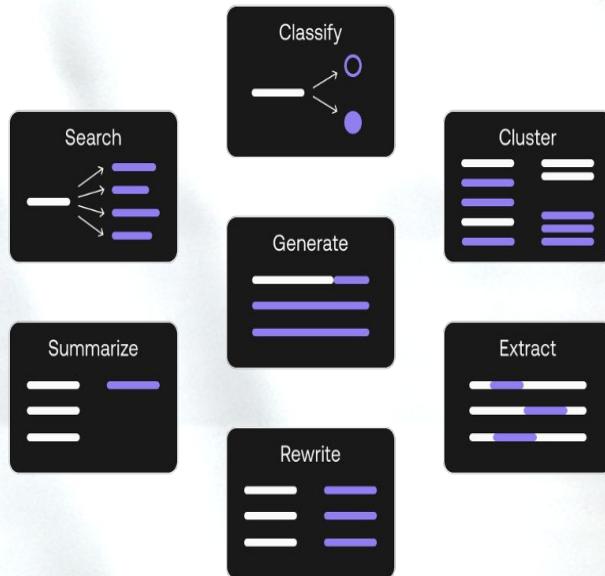
GPT-1: The first version of GPT was introduced in 2018 and had a model size of 117 million parameters. It was trained on a large corpus of text data and was capable of performing various natural language processing tasks such as language translation and text summarization.

GPT-2: The second version of GPT was introduced in 2019 and had a model size of 1.5 billion parameters. It was trained on an even larger corpus of text data and was capable of generating text that was difficult to distinguish from text written by a human.

GPT-3: The latest and most powerful version of GPT was introduced in 2020 and has a model size of 175 billion parameters. It is capable of performing a wide range of natural language processing tasks, including question answering, language translation, and text generation, with remarkable accuracy and fluency.

Large Language Model

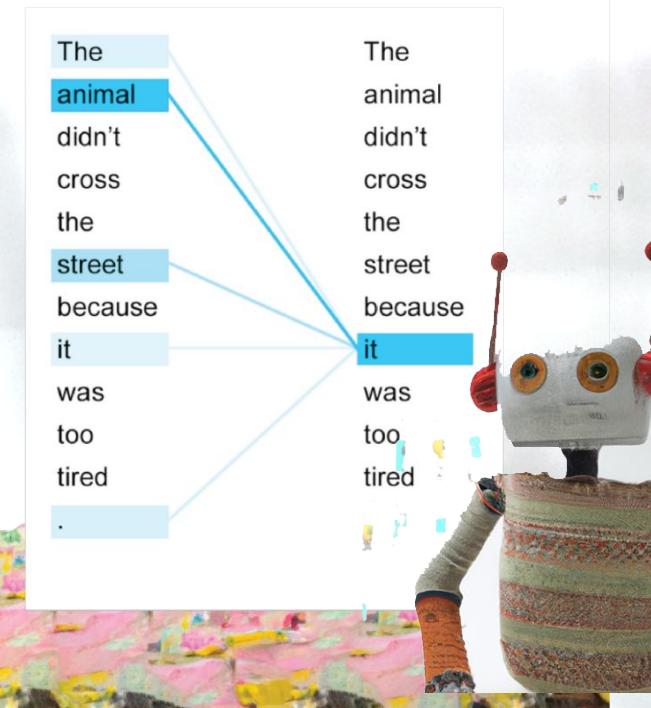
A large language model is a type of artificial intelligence algorithm that has been trained on massive amounts of textual data in order to generate human-like language output. These models are typically based on neural network architectures, and they are capable of performing a wide range of natural language processing tasks, such as language translation, question-answering, text summarization, and language generation.



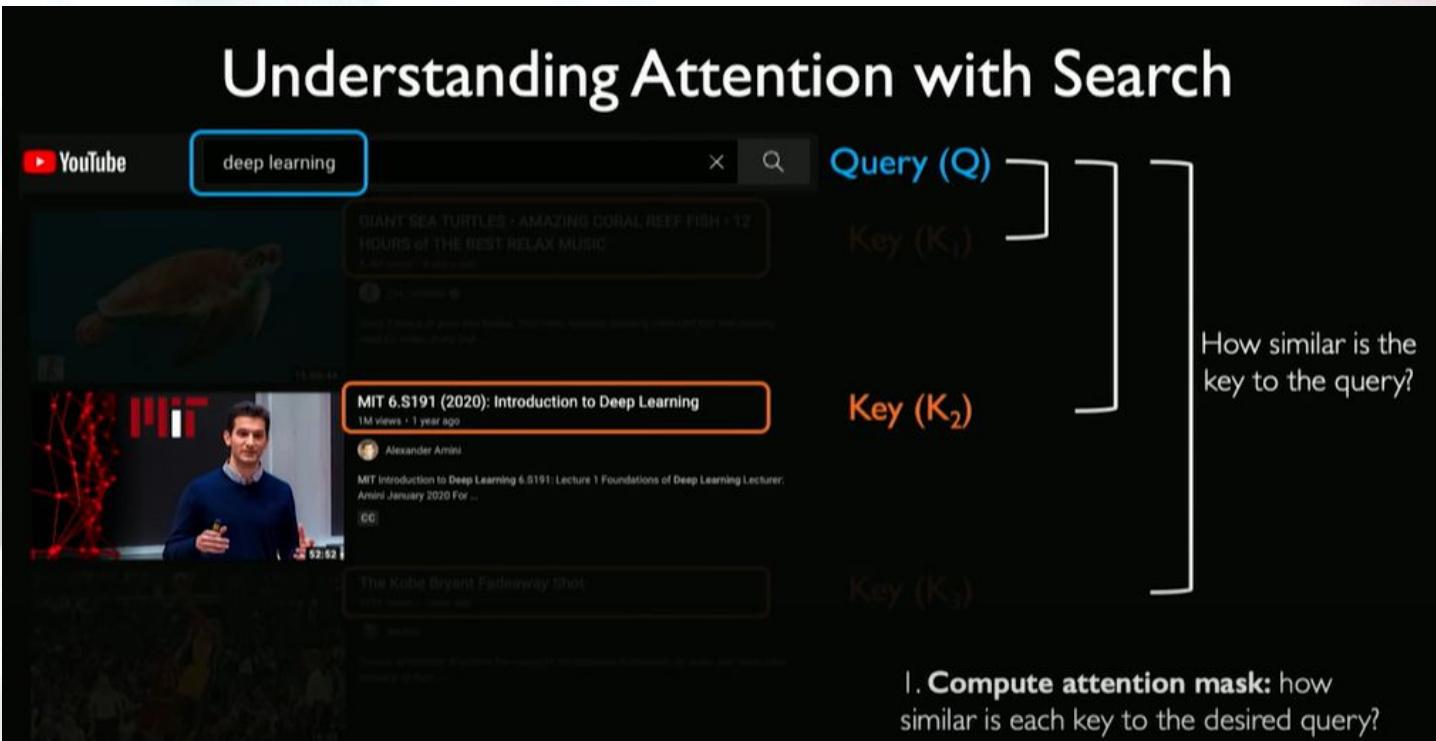
Transformer Neural Networks

Attention is all you need!

Attending to
the most important
parts of the input



Understanding Attention with Search



Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

He tossed the tennis ball to serve

x

Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

- I. Encode **position** information

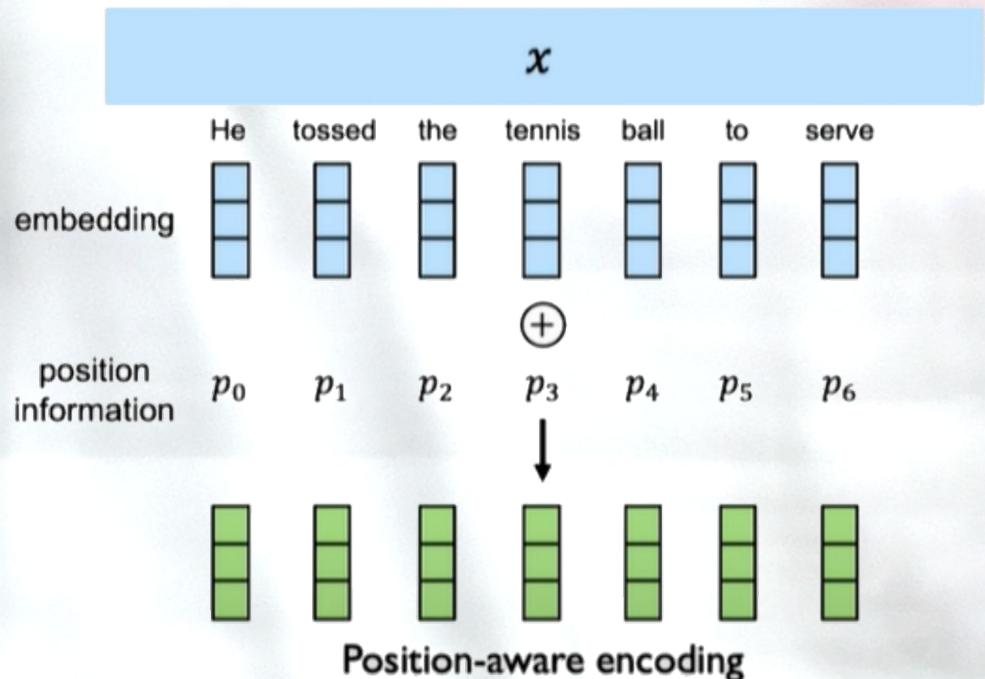
x
He tossed the tennis ball to serve

Data is fed in all at once! Need to encode position information to understand order.

Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

- I. Encode **position** information

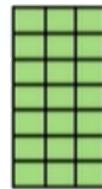


Data is fed in all at once! Need to encode position information to understand order.

Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

1. Encode **position** information
2. Extract **query, key, value** for search



Positional
embedding

Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

1. Encode **position** information
2. Extract **query**, **key**, **value** for search

$$\begin{matrix} \text{Positional embedding} \\ \times \end{matrix} \quad \begin{matrix} \text{Linear layer} \end{matrix} = \begin{matrix} \text{Query} \end{matrix}$$

$$\begin{matrix} \text{Positional embedding} \\ \times \end{matrix} \quad \begin{matrix} \text{Linear layer} \end{matrix} = \begin{matrix} \text{Key} \end{matrix}$$

$$\begin{matrix} \text{Positional embedding} \\ \times \end{matrix} \quad \begin{matrix} \text{Linear layer} \end{matrix} = \begin{matrix} \text{Value} \end{matrix}$$

Positional embedding Linear layer Output

Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

Attention score: compute pairwise similarity between each **query** and **key**

1. Encode **position** information
2. Extract **query**, **key**, **value** for search
3. Compute **attention weighting**

How to compute similarity between two sets of features?

Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

1. Encode position information
2. Extract **query**, **key**, **value** for search
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How to compute similarity between two sets of features?



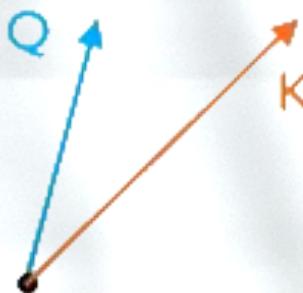
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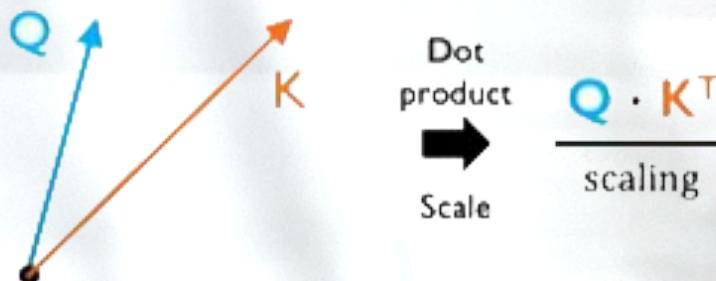
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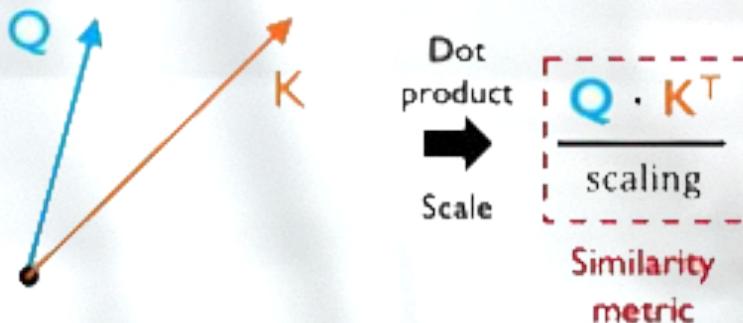
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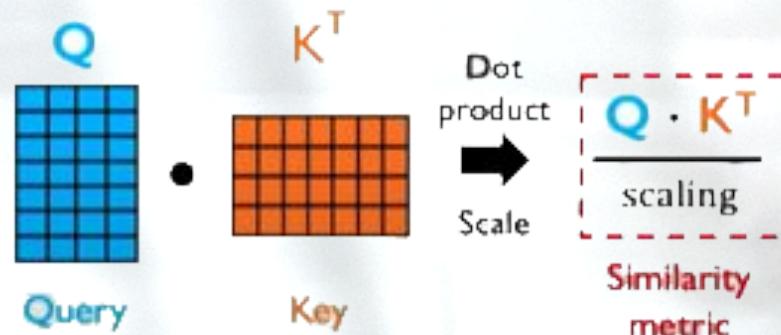
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How to compute similarity between two sets of features?



Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

1. Encode **position** information
2. Extract **query, key, value** for search
3. Compute **attention weighting**

Attention weighting: where to attend to!
How similar is the key to the query?

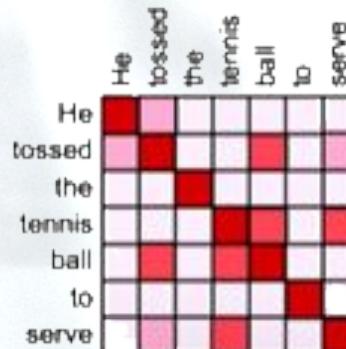
	He	tossed	the	tennis	ball	to	serve
He							

Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

1. Encode **position** information
2. Extract **query**, **key**, **value** for search
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Attention weighting: where to attend to!
How similar is the key to the query?



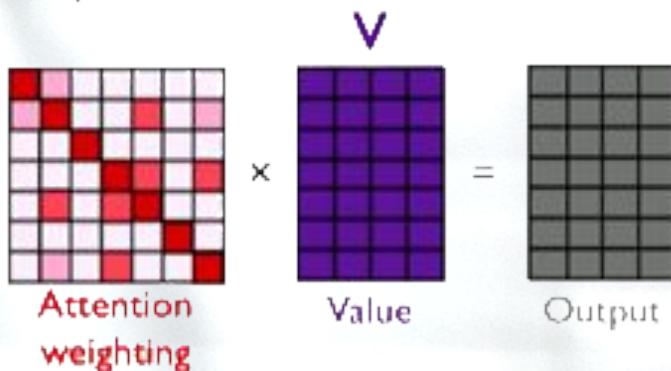
$$\text{softmax} \left(\frac{Q \cdot K^T}{\text{scaling}} \right)$$

Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

1. Encode **position** information
2. Extract **query**, **key**, **value** for search
3. Compute **attention weighting**
4. Extract features with high attention

Last step: self-attend to extract features



$$\text{softmax} \left(\frac{Q \cdot K^T}{\text{scaling}} \right) \cdot V = A(Q, K, V)$$

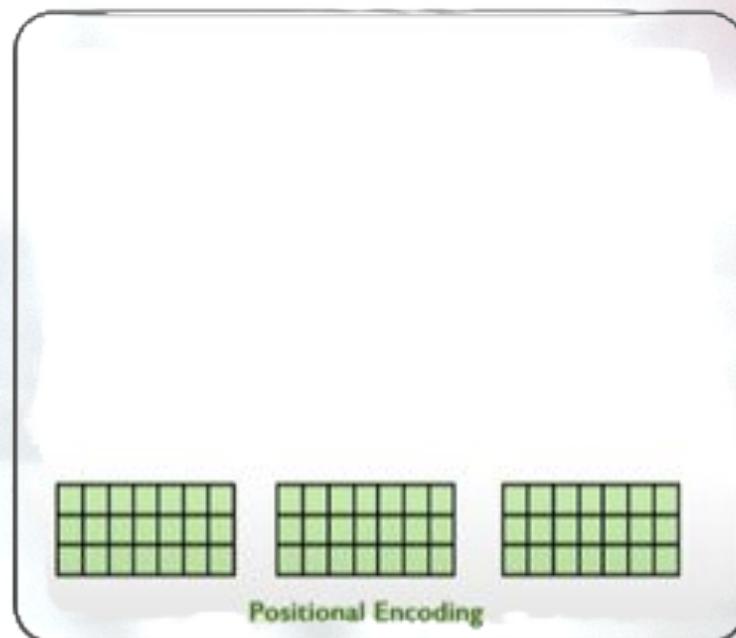
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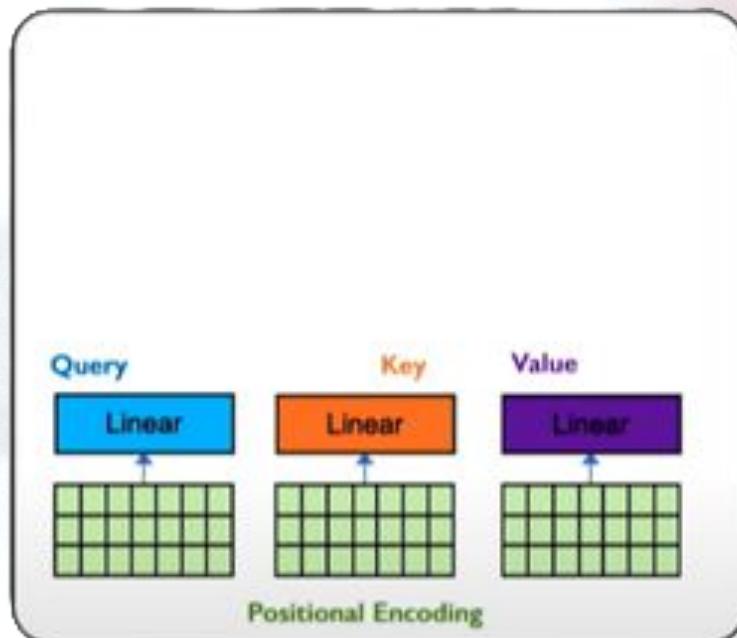
- I. Encode position information



Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

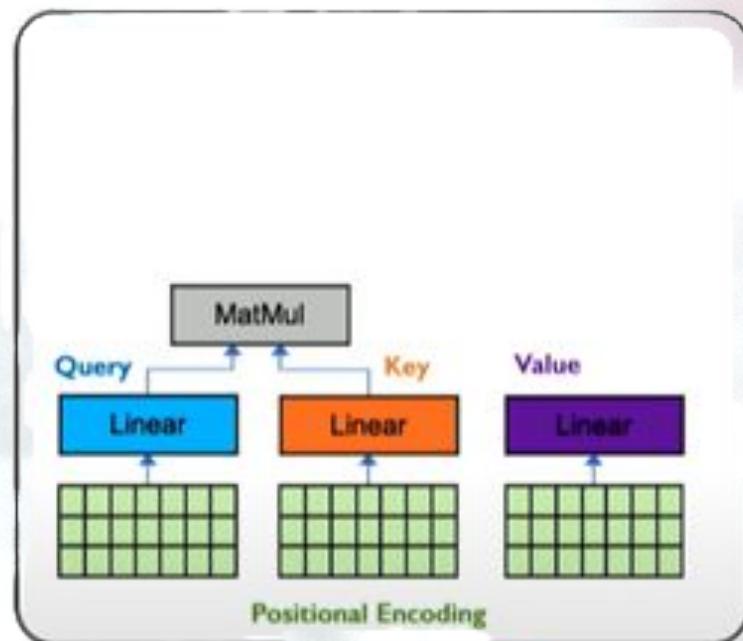
1. Encode **position** information
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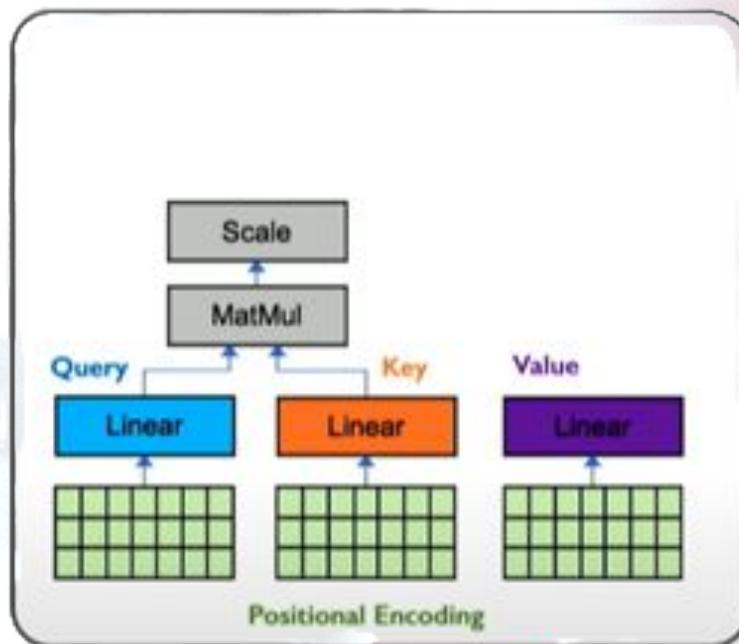


$$\text{softmax} \left(\frac{Q \cdot K^T}{\text{scaling}} \right) \cdot V$$

Learning Self-Attention with Neural Networks

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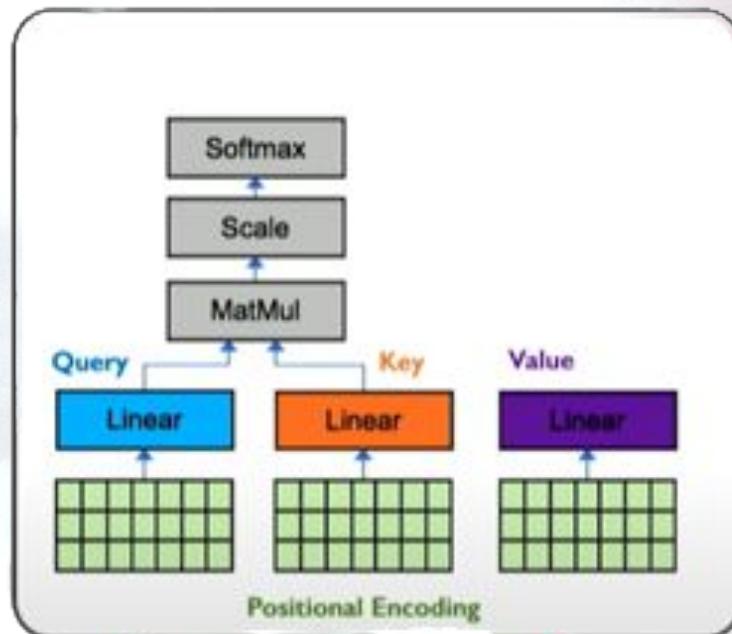


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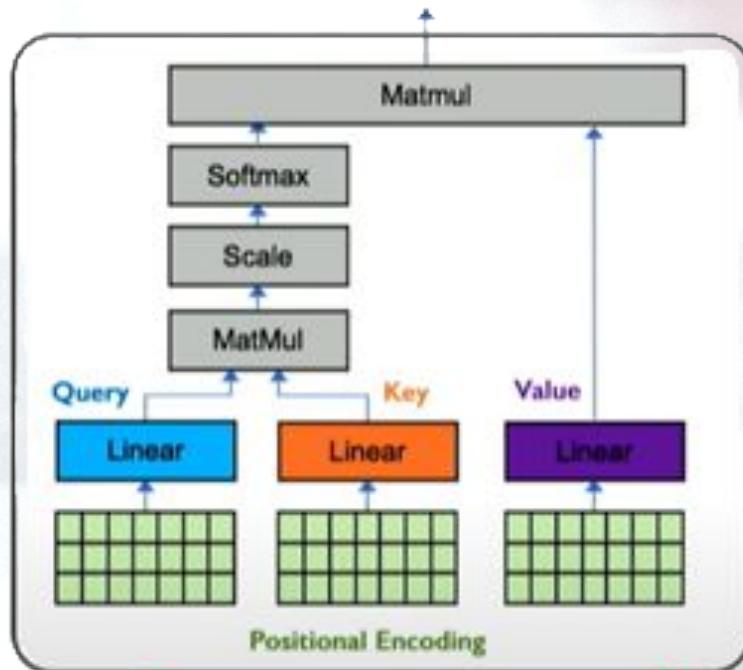


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Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

1. Encode **position** information
2. Extract **query, key, value** for search
3. Compute **attention weighting**
4. Extract **features with high attention**



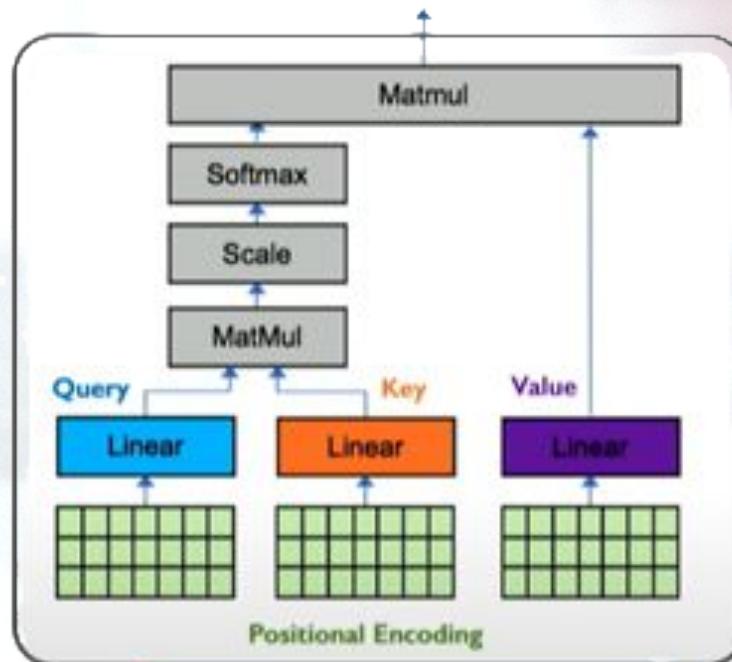
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Learning Self-Attention with Neural Networks

Goal: identify and attend to most important features in input.

1. Encode position information
2. Extract query, key, value for search
3. Compute attention weighting
4. Extract features with high attention

These operations form a self-attention head that can plug into a larger network. Each head attends to a different part of input.



$$\text{softmax} \left(\frac{Q \cdot K^T}{\text{scaling}} \right) \cdot V$$

The Impact!

ChatGPT Sprints to One Million Users

Time it took for selected online services to reach one million users



* one million backers ** one million nights booked *** one million downloads
Source: Company announcements via Business Insider/LinkedIn



statista

FEB. 27 / MARCH 6, 2023

TIME

Hi ChatGPT

Hello! How can I assist you today?

What do you think of a TIME cover story with the title, "The AI Arms Race Is Changing Everything?"

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by ANDREW R. CHOW & BILLY PERRIGO (humans)

time.com

ADVANTAGES AND LIMITATIONS OF CHAT GPT

ADVANTAGES:



BROAD
KNOWLEDGE



NATURAL
LANGUAGE
PROCESSING



AVAILABILITY.

ADVANTAGES:



SCALABILITY



CONSISTENCY



VERSATILITY.

LIMITATIONS:



LACK OF COMMON
SENSE.

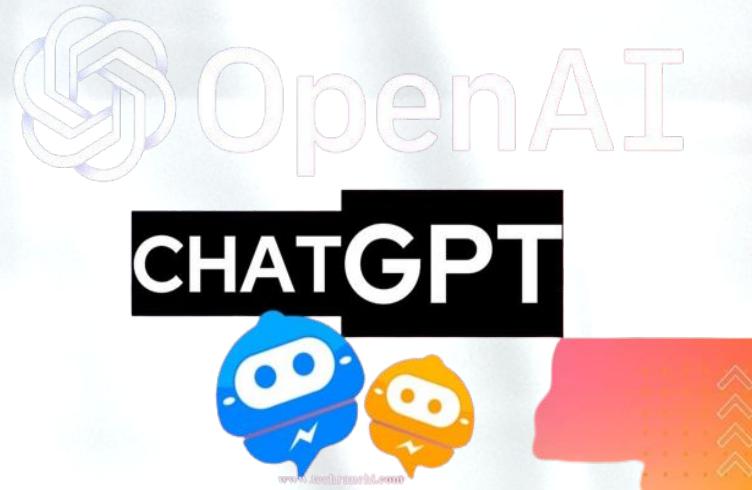


DIFFICULTY WITH
COMPLEX OR
TECHNICAL
KNOWLEDGE.

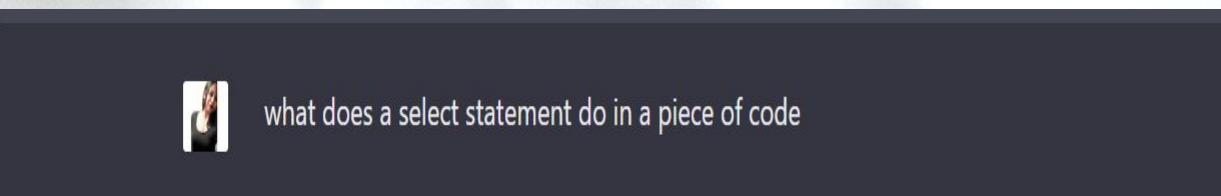


BIAS TRAINING
DATA

- Chat GPT is an advanced language model that can understand and generate text.
- We can use it to create content of our website, write cover letters for companies, tweets, emails etc.
- We can also use this to generate code in different programming languages such as Python, Java script, HTML, CSS AND MUCH MORE.



- You can visit Chat GPT to generate dummy data, translate text or code from one language to another.
- Not only this, you can even visit to explain code which you don't understand, you can ask Chat GPT and it will explain it to you like a patient teacher.
- For example:



A SELECT statement in SQL is used to retrieve data from one or more tables in a database.



When used in a piece of code, the SELECT statement specifies the data that the programmer wants to retrieve from the database. The data can be filtered, sorted, grouped, and aggregated using various SQL clauses such as WHERE, ORDER BY, GROUP BY, and HAVING.

The basic syntax of a SELECT statement is as follows:

```
sql
SELECT column1, column2, ...
FROM table_name
WHERE condition;
```

Copy code

Here, `SELECT` is the SQL keyword that starts the statement, followed by a comma-separated list of column names or expressions that the programmer wants to retrieve from the specified table(s). `FROM` is another SQL keyword that specifies the table(s) from which to retrieve the data. The `WHERE` clause is optional but is used to filter the data based on certain conditions.

Once the SELECT statement is executed, the result set containing the data that meets the specified conditions is returned. The result set can be used in subsequent code logic to perform further processing, display the data to the user, or store the data in a variable or file.

Interesting fact: Chat GPT can even help you learn...

- Here's how:
- If you are preparing for an interview you can even ask chat gpt to ask you technical questions and it will help you with certain questions which will help you for job interviews.



Act as an Technical Interviewer and ask me 5 questions on SQL.



Sure, here are five potential interview questions about SQL:

1. What is a join in SQL and how is it used?
2. What is the difference between the WHERE and HAVING clauses in SQL?
3. Explain the difference between a primary key and a foreign key in a relational database.
4. What is normalization in SQL and why is it important for database design?
5. What are some common aggregate functions in SQL and what do they do?

I hope these questions are helpful for your interview preparation!

USE CASE OF CHAT GPT.

- Chat GPT provides different language models for different purposes
- GPT 3 models which are trained and generated to understand natural language like English.
- And CodeX which are specifically trained to understand and generate code.

EXAMPLES:

- GENERAL STUFF:
 - Learn new things.
 - Write shell scripts
 - Write git commands
 - Start a business
 - Write legal docs
 - Write a resume
 - Prepare for an interview



Sentiment Analysis using GPT-3

This presentation examines the performance of GPT-3 for sentiment analysis of restaurant reviews, exploring the challenges of sentiment analysis and the potential of GPT-3 for future research.



Restaurant Reviews

REVIEW 1

The Sushi Bar: The sushi at The Sushi Bar was mediocre at best. The rolls were small and not very filling, and the fish didn't taste particularly fresh. The service was slow and inattentive, and our server didn't seem to know much about the menu. The ambiance was sterile and lacking in personality, making for a rather unremarkable dining experience.

REVIEW 2

The Blue Elephant: This Thai restaurant is a hidden gem in the heart of the city. The food is absolutely delicious, and the service is fantastic. The menu offers a wide range of authentic Thai dishes, from spicy curries to flavorful stir-fries. I highly recommend the pad Thai and the green curry. The ambiance is cozy and inviting, perfect for a romantic dinner or a night out with friends.

What let you understand the reviews

1. KNOWING THE LANGUAGE
2. BEEN TO A RESTAURANT
3. CONTEXT CLUES
4. BRINGING IT ALL TOGETHER

What is Sentiment Analysis?

- Sentiment analysis (also known as opinion mining) is a NLP technique used to analyze and understand people's opinions, attitudes, and emotions expressed in written or spoken language.
- The main goal of sentiment analysis is to automatically identify the polarity of a text as positive, negative, or neutral, based on the emotional content conveyed by the words, phrases, and expressions used in the text.



Challenges of Sentiment Analysis

- Interpreting tone, mid-polar phrases, sarcasm, emojis, idioms, negations, and comparative sentences.
- Smart, precise sentiment analysis API with massive language dataset.
- Understanding subjective statements, detecting context, and understanding emojis.
- Multilingual sentiment analysis requires unique part-of-speech taggers, lemmatizers, and grammatical constructs.

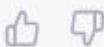


RI

give me an example of a restaurant review of which you can't identify the polarity



Sure, here's an example of a restaurant review that is difficult to determine the polarity:



Review: "The restaurant had a nice ambiance, but the food was not what I expected. The service was average."

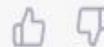
Analysis: This review is relatively neutral in tone. The reviewer compliments the restaurant's ambiance, which could be seen as positive. However, they also express disappointment in the food, which could be seen as negative. The mention of average service doesn't really convey a strong sentiment either way. Overall, it's difficult to determine whether the review is positive, negative, or neutral, as it contains both positive and negative elements.

RI

thai basil me sabse acha thai green curry milta hai lekin staff bohot slow hai



Sure, here's an analysis of the polarity of the given restaurant review:



Review: "Thai Basil serves the best Thai green curry I've had, but the staff is very slow."

Analysis: This review contains both positive and negative elements, so the polarity is mixed.

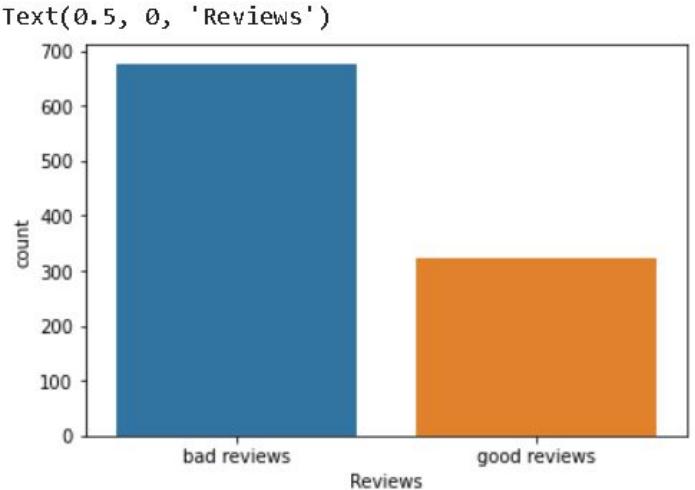
The reviewer states that the Thai green curry at the restaurant is the best they've had, which is a positive sentiment. However, they also mention that the staff is slow, which could be seen as a negative sentiment. Overall, the review is mixed in polarity, with a positive sentiment towards the food and a negative sentiment towards the staff.

Methodology for using gpt-3 for classifying restaurant reviews in real-time

1. Asked danvici (OPEN AI MODEL) to generate 350 good and bad reviews respectively.
2. Used autotokenizer (NLP MODEL) to assign a sentiment to each one.
3. Trained a random forest classifier with this data.
4. Tested the classifier with about 1000 real restaurant reviews and printed out the results.

Results of GPT-3 for Sentiment Analysis

- Highly effective in categorizing the sentiment of restaurant reviews in real-time.
- Potential for sentiment analysis in various industries, including hospitality.



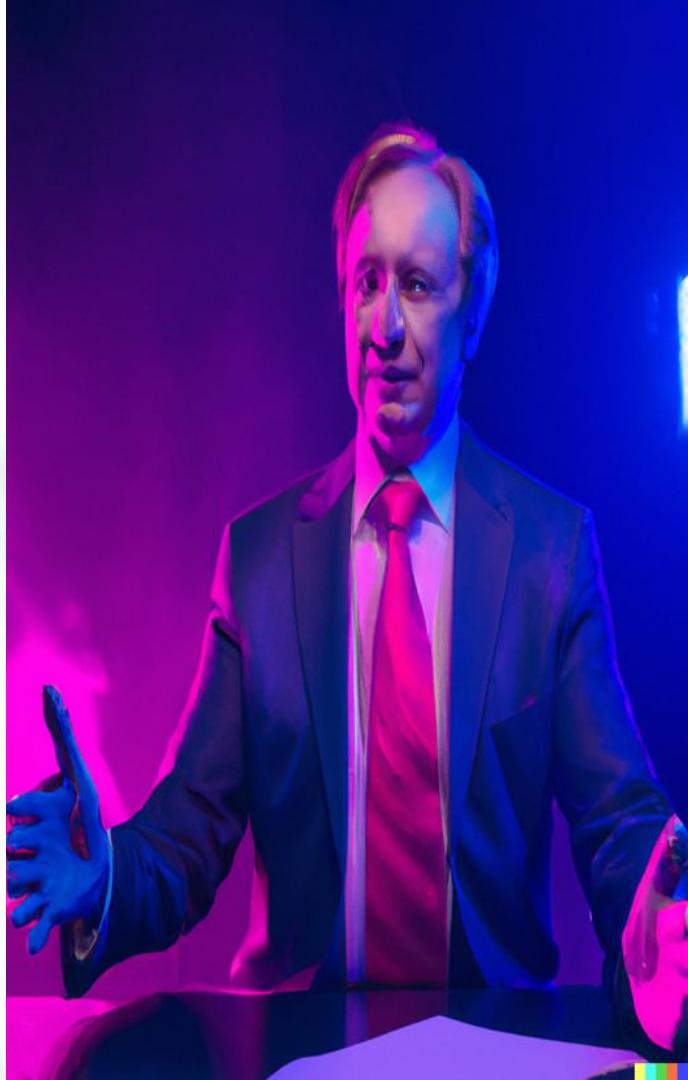
Future Work

- Explore potential of GPT-3 for sentiment analysis in other industries.
- Investigate other AI models and techniques for sentiment analysis.
- GPT-3 for multilingual sentiment analysis.



Conclusion

- GPT-3 has potential for sentiment analysis with faster analysis, real-time analysis, and better understanding of customer needs.



NI

What DALLE prompt would I use to create a illustration of a robot skunk that is standing like a human with a laptop speaking with a ChatGPT robot in a style that is a mix of keith haring and mc escher?



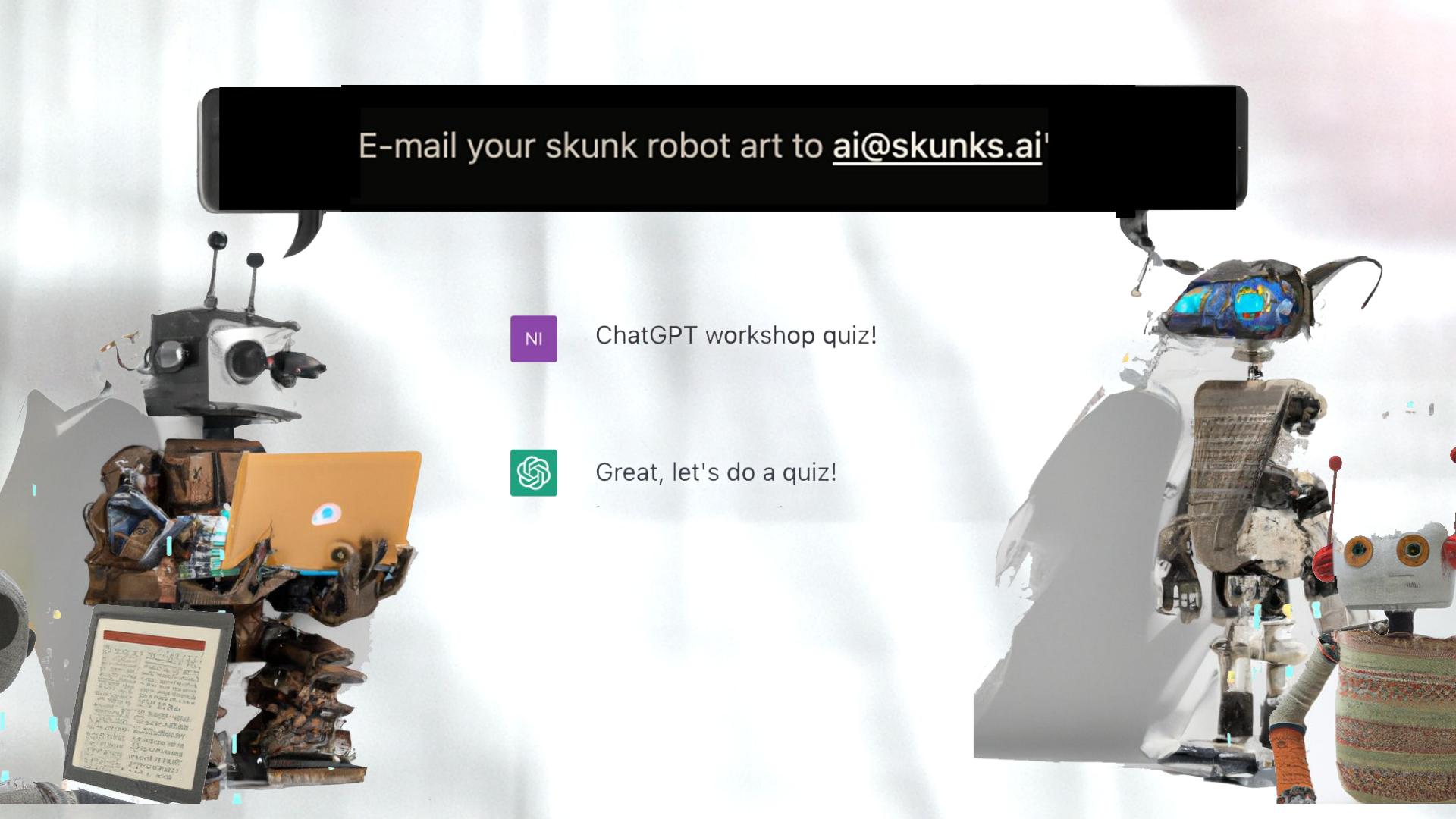
Here's a DALL-E prompt that you could use to generate an illustration of a robot skunk standing like a human with a laptop speaking with a ChatGPT robot in a style that is a mix of Keith Haring and M.C. Escher:



Copy code

Draw a robot skunk standing on two legs like a human, holding a laptop compu

Note that the prompt should be fed to DALL-E along with any additional specifications or adjustments that you may want to make, such as the size, colors, and orientation of the illustration.



E-mail your skunk robot art to ai@skunks.ai

NI

ChatGPT workshop quiz!



Great, let's do a quiz!



Pratik P S, Shwetha Mishras



chat GPT



Asynchronous Workshops



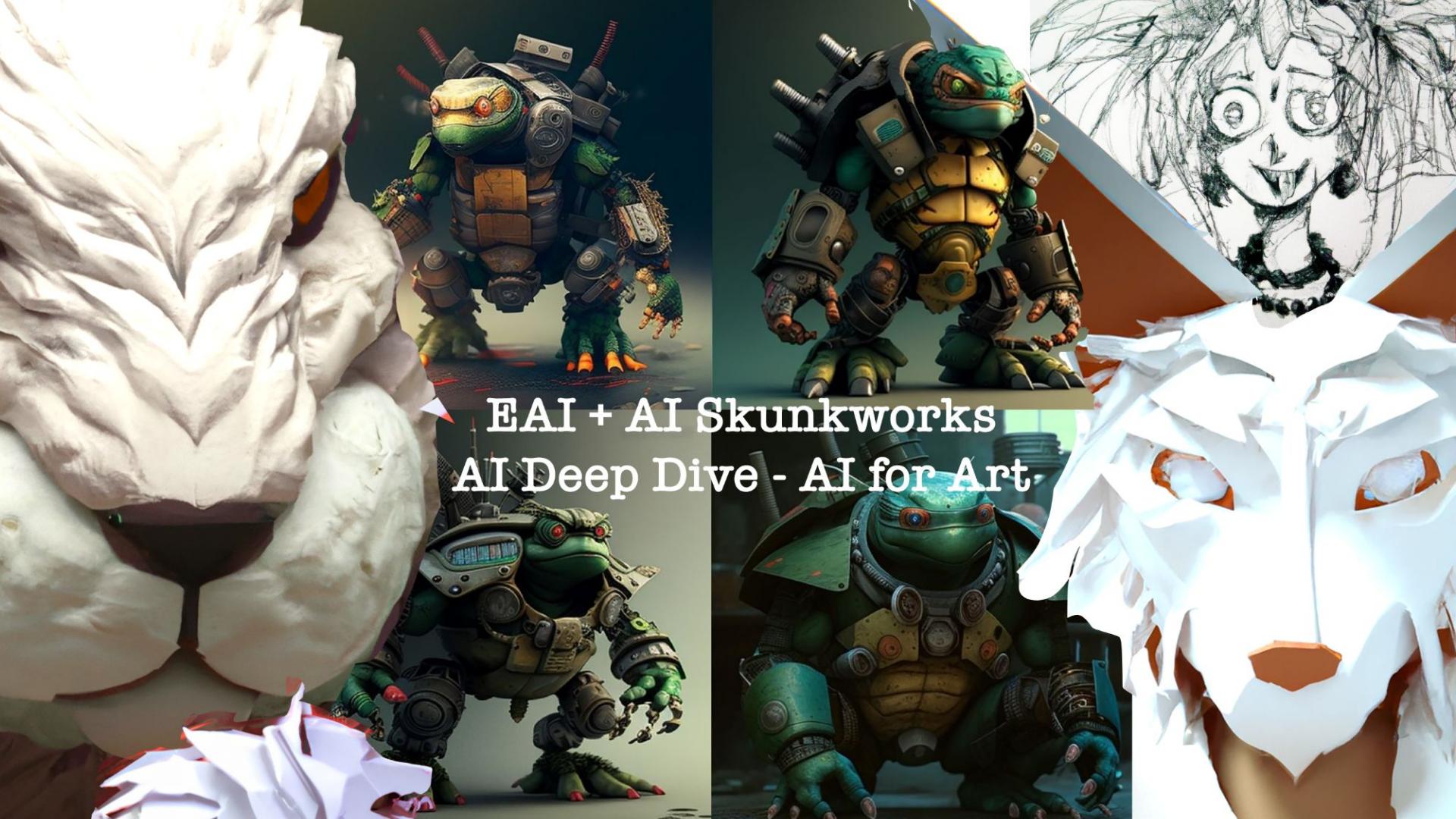
>/inspect shower

The curtain of the shower booth gently drifts with the warm wind.
Every now and then a small droplet escapes the shower head. You
wonder if it is working?

>/search shower

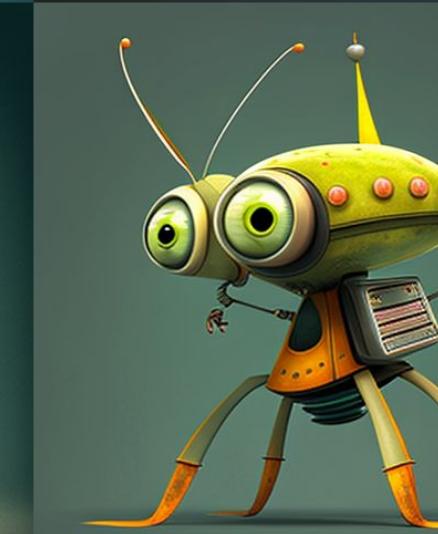
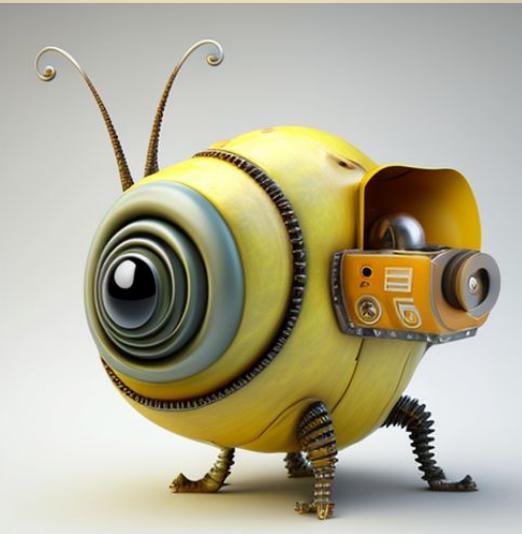
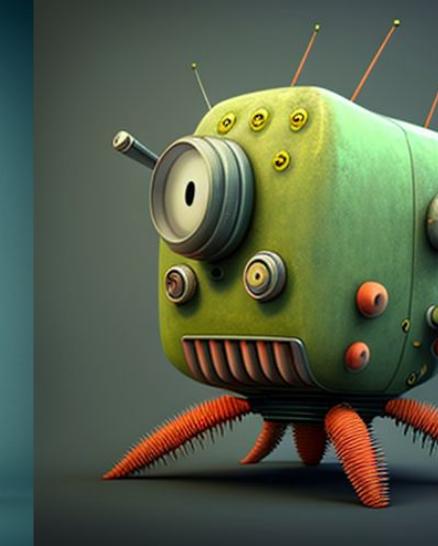
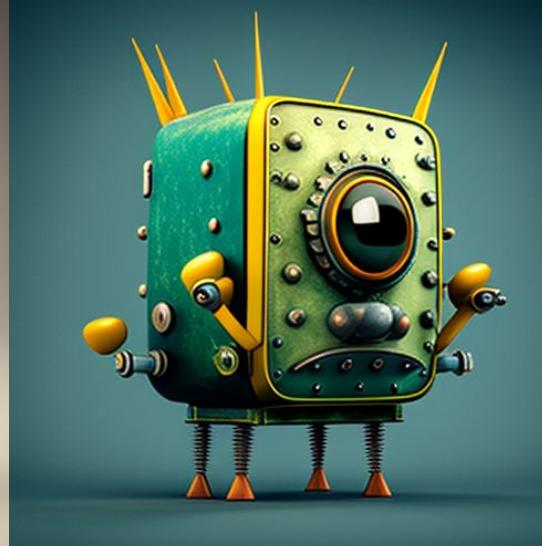
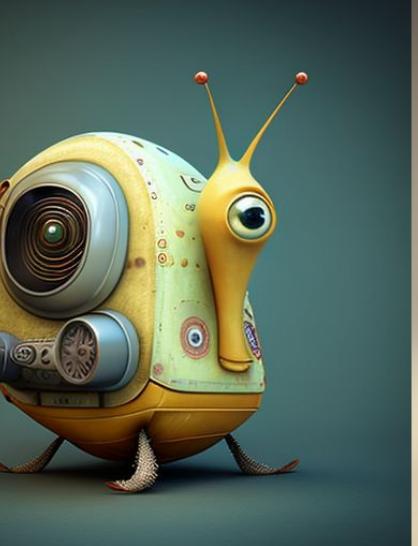
The curtain of the shower booth gently drifts with the warm wind.
Every now and then a small droplet escapes the shower head. You
wonder if it is working?

>/examine



EAI + AI Skunkworks

AI Deep Dive - AI for Art



NI

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