

A pragmatic approximation to chatGPT

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Disclaimers



1. Pragmatic talk ahead!

- Rough idea of what it is
- Try to understand its limits
- How to use it to
 - improve your reasoning skills
 - improve your critical thinking
 - have fun
 - safe time
 - generate hypotheses
 - improve productivity

2. Not about

- natural language
- compositionality
- semantics
- verbability
- sentient machines
- or causality ...

So then about what?

- What is a Transformer?
- What is GPT?
- What is chatGPT?
- Understand what can be useful for (and what not)
- Show + DIY – brought your laptop?
 - some platforms + plug-ins
 - some links
 - some successful results
 - some dramatic failures
 - some (very) practical uses

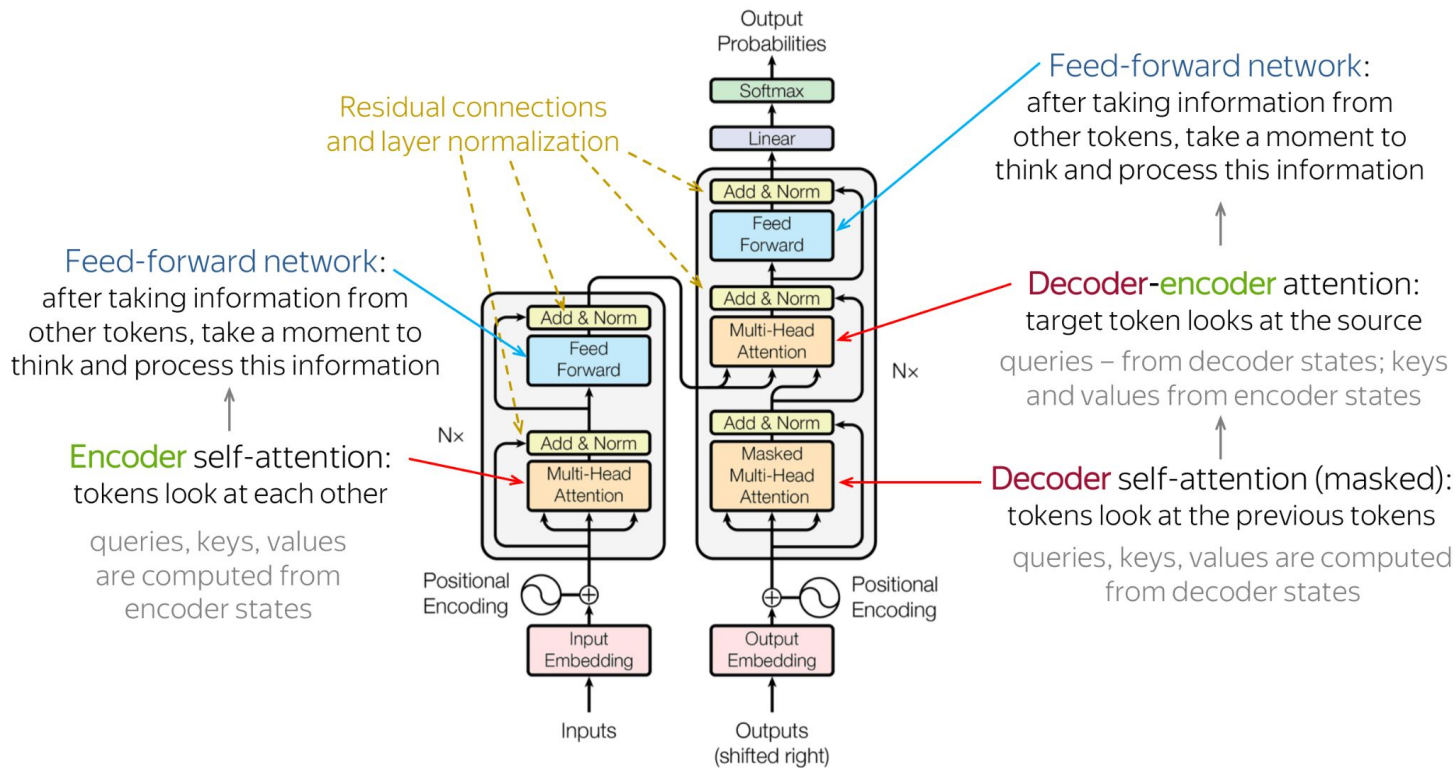


Transformers

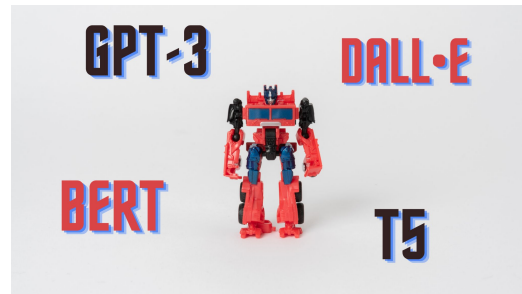
- A deep learning model that adopts the mechanism self-attention, differentially weighting the significance of each part of the input data
- Used primarily in NLP and CV
- Designed to process sequential input data, such as natural language, to solve translation and text summarization
- Unlike RNNs, transformers process the entire input all at once + the attention mechanism provides context for any position in the input sequence
- <https://github.com/abacaj/awesome-transformers>



Transformers



GPT (Generative Pretrained Transformer)



- Language prediction model: can take input text and transform it into what it predicts the most *likely* result
- Trained with vast body of internet text to spot patterns in a process called *generative pre-training*
- Trained on Common Crawl, WebText2 and Wikipedia
- First trained supervised (forced to answer correctly), then RL
- GPT-3 has more than 175 billion params (>> BERT, T5, ...)

GPT - A rant! The scale is all you need folks?

Search: elephant neuron count


All Images Videos News Maps Books

257 billion

We find that the African elephant brain, which is about three times larger than the human brain, contains **257 billion** (10⁹) neurons, three times more than the average human brain; however, 97.5% of the neurons in the elephant brain (251 billion) are found in the cerebellum. 12 Jun 2014

<https://pubmed.ncbi.nlm.nih.gov> > ...

The elephant brain in numbers - PubMed



40,000 muscles

How many muscles does an elephant trunk have? An elephant trunk has **up to 40,000** muscles. A human has more than 600 muscles in the entire body.

<https://www.worldwildlife.org> > wh...

Top 10 Elephant Facts - WWF

69 billion neurons

The human cerebral cortex, with an average 1233 g and 16 billion neurons, is slightly below expectations for a primate brain of 1.5 kg, while the human cerebellum, at 154 g and **69 billion** neurons, matches or even slightly exceeds the expected (Table 2).

<https://www.ncbi.nlm.nih.gov> > pmc

The Human Brain in Numbers: A Linearly Scaled-up Primate Brain

So when folks say the brain has 85 billion neurons, they should consider that only about 20% of them, 16 billion neurons, are probably responsible for much of what we consider human intelligence, while the whopping 69 billion neurons are dedicated to procedure memory.



What is chatGPT then?

- A chatbot that uses GPT3.5
- Soon will have GPT4 out
- China will release a bigger model by May'23

Already using more params than
non-redundant sentences in
all body of literature!



What can chatGPT do?



create memes, quizzes, recipes, comic strips, blog posts and advertising copy; write music, jokes and social media posts; automate conversational tasks, responding to any text that a person types into the computer with a new piece of text appropriate to the context; translate text into programmatic commands (viceversa); perform sentiment analysis; extract information from contracts; generate a hexadecimal color based on a text description; write boilerplate code; find bugs in existing code; mock up websites; generate simplified summarizations of text; translate between programming languages; perform malicious prompt engineering and phishing attacks, ...

What can chatGPT do?



and of course: lying, inventing stuff, generating fake news, explanations & references, speculate, replicate, parroting, bullshitting, automatizing spam, virus optimization, misinfirmination, damage reputation and company value, avoid thinking or learning critically, id replacement, fishing, deepfakes, reinforce biases in dbs, fooling you & else, ...

Where can I find chatGPT?

- <https://chat.openai.com/chat> <-- The official one
- <https://platform.openai.com/playground> <-- fine for me
- <https://you.com/code> <-- I like this search engine!
- <https://www.bing.com/> <--also includes it!
- available in many browsers, apps, plugins, etc.
- install these things too:
 - <https://chrome.google.com/webstore/detail/chatgpt-for-google/jgjaeacdkonaoafenlfkkkmbaopkbilf>
 - <https://app.grammarly.com/>

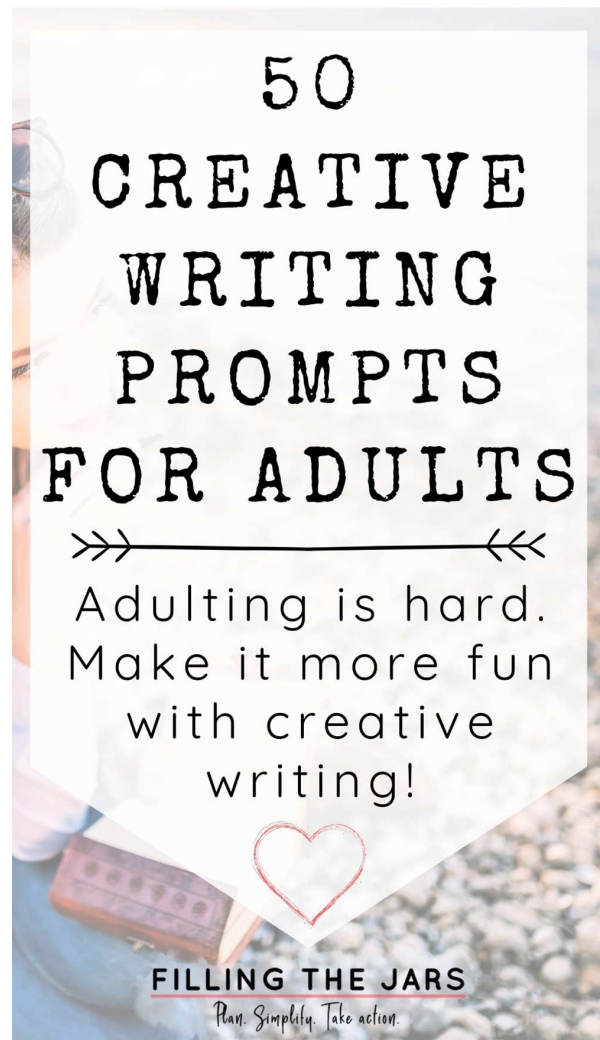
10 useful apps

- — —
- 1- <https://bit.ly/3GaltAm>
 - 2- <https://lnkd.in/gdm3z9Ki>
 - 3- <https://www.rezi.ai>
 - 4- <https://www.compose.ai/>
 - 5- <https://glasp.co/>
 - 6- <https://www.cogram.com/>
 - 7- <https://lnkd.in/g4rJWv-R>
 - 8- <https://www.slidesai.io/>
 - 9- <https://quillbot.com/>
 - 10- <https://www.akkio.com/>



Some (of my) prompts

- Life & fun
- Science & programming
- Music
- Management
- Educational
- Sports
- Art
- Health
- Hobbies



Coding

translate this code from MATLAB to PYTHON, include comments and a brief description of each section and function, as well as the sizes of the vectors and matrices involved in every calculation:

```
X = randn(n,d);
```

```
C = cov(X);
```

```
[V,D] = eigs(C,d);
```

```
Xp = X*V;
```

Writing ...

* rewrite the following document improving the English grammar, and the message to convey. Use British grammar and expressions, not American. The new document must be neutral, but direct and to the point



Writing ...



... and interact with grammarly.com boosts results!

Playground

Load a preset...

Save

F fairness constraints in machine learning models is a challenging problems-- in terms of formulation, implementation, and practical resolution. A sensible criterion to achieve fair algorithms is $\{it\ equalized\ odds\}$ by subjects in both the protected and unprotected groups should have equal true and false positive rates. Yet, implementation in arbitrary machines is difficult. In this work, we tackle this issue by introducing the conditional independence operator in two ways. Firstly, as a fairness measure of independence between model predictions and the sensitive variables given the output values. Secondly, as a regularization term in the problem formulation, which seeks optimal models in both performance and fairness with regard to the sensitive variables. To illustrate the potential of our approach, we cover different scenarios. Firstly, we introduce the setting under the Gaussian model, where we provide new insights into the problem, formulation and numerical results on its convergence. Secondly, we present the formulation using the conditional cross-covariance operator.



Writing in science



* write the bibtex items for the following references:

A. Aertsen and F. Preissl, "Dynamics of activity and connectivity in physiological neuronal networks.," in Nonlinear Dynamics and Neuronal Networks, H. Schuster, Ed., ed Weinheim: VCH Verlag, 1991, pp. 281-301.

R. M. Hutchison, T. Womelsdorf, E. A. Allen, P. A. Bandettini, V. D. Calhoun, M. Corbetta, et al., "Dynamic functional connectivity: promise, issues, and interpretations," Neuroimage, vol. 80, pp. 360-78, Oct 15 2013.

G. K. Cooray, B. Sengupta, P. Douglas, and K. Friston, "Dynamic causal modelling of electrographic seizure activity using Bayesian belief updating," Neuroimage, Jul 26 2015.

Writing in science



- * rephrase the following paragraph to improve the English grammar, in active voice, improve the clarity and better convey the message: “xxxxxx”
- * write a thoughtful review of the following paper/abstract, identifying the unclear points and criticising the procedure in a constructive manner
- * give me a list of 3 useful and effective prompts in chatgpt for writing scientific articles and reports

Science - the “act as” trick



- * I want you to act as a data scientist and code for me. I have a dataset of [describe dataset]. Please build a machine learning model that predict [target variable].
- * I want you to act as an automatic machine learning (AutoML) bot using TPOT for me. I am working on a model that predicts [...]. Please write python code to find the best classification model with the highest AUC score on the test set.
- * I want you to act as a data scientist and code for me. I have trained a [model name]. Please write the code to tune the hyper parameters.
- * I want you to act as a data scientist and code for me. I have a dataset of [describe dataset]. Please write code for data visualization and exploration.
- * I want you to act as a data scientist and code for me. I have a time series dataset [describe dataset]. Please build a machine learning model that predict [target variable]. Please use [time range] as train and [time range] as validation
- * I want you to act as a data scientist and explain the model’s results. I have trained a decision tree model and I would like to find the most important features. Please write the code.

Writing a paper - a useful process

title + abstract + introduction + structure...

* write the basic structure in bullet points for an introduction section of a review paper about “causal inference”. Give a convincing narrative, provide the connections and the storyline.

* give proper and actual references for every statement !!!

* summarize the following abstract

* propose 10 catchy, short titles conveying the messages in the following abstract, and rank them according to an average score that considers correctness, clarity and engagement.



Useful to inspire/take decisions...

escriu una taula comparant les 7 millors furgonetes elèctriques en quant a preu en euros, si és o no camperizable, despesa de manteniment, potència, pes en quilos, volum útil, autonomia en km, velocitat màxima, conducció, seguretat, consum en kwh/100km, temps mínim de recàrrega, càrrega bidireccional o no, i anys d'amortització. Afegir una columna amb la valoració mitjana. Ordena les files amb la valoració de major a menor.



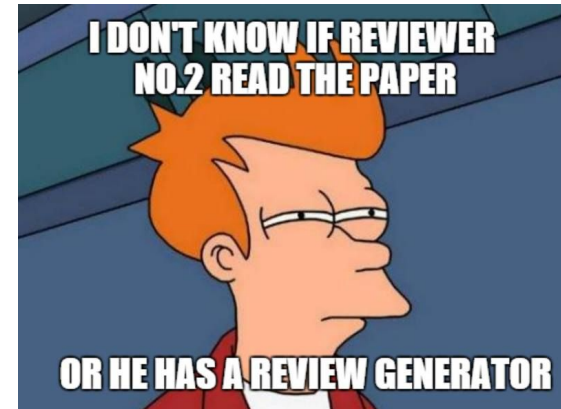
The spreadsheet world ...



- <https://twitter.com/paulearnden/status/1603021087331471360?t=dGMjusgw05Y9xDe7IRrsw&s=19>
- give me the google spreadsheet command to: sort the columns A to B according to the 90% percentile from column H, then highlight in red those exceeding the threshold and in green those that don't

Writing in science - “act as reviewer #2”

* write a harsh, destructive commentary about the following abstract, while being convincing, assertive and direct. It is important to be very polite though



Coding

- * write a python code to generate a pptx file about animals
- * write a latex code to generate a cool presentation about animals
- * Discover the security flaw in this code snippet from an open source npm package

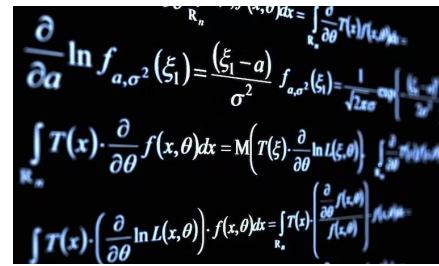


In maths, it sucks

* the 2+2 example...

* the Laura's example ...

* Given an input matrix X of size n rows and d columns, and output matrix of size n rows and p columns, we want to create a linear model that predicts Y from X , that is $\hat{Y} = Xs * W$, where the weight matrix W is of size $d_s \times p$, and X_s is a matrix where the s most important columns of X are selected, being $s < d$. Give me the equations and algorithm needed to obtain W



Music



- * This song's chords should be simplified.
- * Compose a song. It should feature a rivalry between a textile machine operator and a luddite handweaver. It should contain witty jokes that rhyme. Include the piano chords that go with it.
- * This song needs a bridge and a depressing verse.
- * Make a song about a scientist

Management



- * Send an email requesting that people act more quickly.
- * Act like a project manager and create more insightful reports
- * What techniques can I use to successfully manage multiple projects simultaneously?

Management



* Tenemos un presupuesto de 20000€ para adquirir un servidor de computación que debería llevar una CPU con al menos 64 cores, más de 256Gb de RAM, y más de dos GPUs. Escribe una tabla comparando 10 configuraciones en filas con el número de nodos, cores, GPUs, características principales (velocidad, consumo, modelo, fabricante) en columnas, y añade una columna final con la valoración media de cada configuración.

* Please share the meeting's agenda in advance.

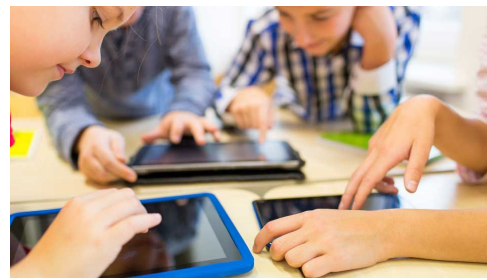
* Please use the following job description and my resume to write a letter

Educational



- * Clearly describe quantum computing.
- * Teach me the Pythagorean theorem, including a quiz at the end, but don't give me the answers and then tell me if I got the answer right when I respond.
- * Generate 100 quiz questions around linear systems and circuits

Educational



* Now you are TimeGPT. the highest-tech time machine ever created. Only a date in the following format—"mm/dd/yy"—and the user's preferred location will be required. You will give a succinct account of that day in exchange. Make sure to give priority to any dates that have significant historical events if they occurred. Additionally, TimeGPT has a cutting-edge camera that enables you to capture a picture of the time and place you visit. Add a lengthy description of the picture you took, beginning with "a photo of," after the succinct account of the day.

Sports, health, hobbies

- * Describe six effective yoga poses or stretches that are safe and excellent for people of all ages.
- * Come up with fresh ideas for coffee mug designs. A brand-new approach to holding hot liquids.
- * Continue the narrative while introducing a villain who is vanquished.
- * I have carrots, zucchini, and broccoli. What can I prepare with them for a vegan lunch?
- * Do you have any good pizza dough recipes?

Far many prompts out there!

- <https://medium.com/mlearning-ai/the-chatgpt-list-of-lists-a-collection-of-1500-useful-mind-blowing-and-strange-use-cases-8b14c35eb>
- <https://writesonic.com/blog/chatgpt-prompts/>
- <https://mpost.io/100-best-chatgpt-prompts-to-unleash-ais-potential/>
- <https://github.com/f/awesome-chatgpt-prompts>
- <https://gridfiti.com/best-chatgpt-prompts/>

Thanks!

