我的教育專欄(404)ChatGPT真的有用嗎?

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最近很多教授提倡學生該善用AI技術，我承認當我們蒐集資料時，應該多多利用電腦技術。Google就對我們很有幫助，假如我們要查非洲尚比亞的首都，利用Google很快就查到了。資料是可以利用電腦找到的，但我在這裡要警告所有同學，學問一定要自己思考才能得到的。

我們教類比電路都會用到一個觀念，叫做load curve。load curve是不難解釋的，如果各位看我的類比電路講義，就可以很容易地知道load curve是怎麼一回事。所以我就用ChatGPT查了一下load curve，結果如下:

the load curve of an amplifier

The load curve of an amplifier is a graph that shows the relationship between the output power of the amplifier and the load impedance that is connected to the output of the amplifier. It provides important information about the performance of the amplifier under different load conditions, and is used to optimize the design of the amplifier to meet specific requirements.

Typically, the load curve shows the maximum output power that can be delivered to the load as the load impedance is varied. For example, at low load impedances, the amplifier may be able to deliver high output power, but as the load impedance increases, the output power may decrease, reaching a minimum value at the maximum load impedance.

The shape of the load curve can vary depending on the frequency of the input signal, the circuit configuration of the amplifier, and the properties of the components used in the amplifier. In general, the load curve is an important tool for determining the operating conditions that will result in the best performance of the amplifier.

In summary, the load curve is a key parameter for the design and optimization of an amplifier, and provides important information about the performance and limitations of the amplifier under different load conditions.

我曾經給一些對load curve完全不懂的同學看以上這段文字，他們看了以後也似懂非懂。我再叫他們看我的講義，我的講義中對load curve有圖示，也有好多例子，絕大多數的同學馬上搞懂了。

我最近在研究一種特別的放大器，這種放大器是amplifier with RF choke。我想知道放大器如果使用了RF choke，它的load curve會變成什麼樣子。於是我用ChatGPT查了一下the load curve of an amplifier with RF choke，結果如下:

the load curve of an amplifier with RF choke

The load curve of an amplifier with an RF choke refers to the relationship between the output power of the amplifier and the load impedance that is connected to the output of the amplifier. The load curve is an important parameter for determining the performance of the amplifier and is often used to optimize the design of the amplifier to meet specific requirements.

The load curve for an amplifier with an RF choke can vary depending on several factors, such as the frequency of the input signal, the circuit configuration of the amplifier, and the properties of the RF choke. Typically, the load curve shows the maximum output power that can be delivered to the load as the load impedance is varied.

For example, at low load impedances, the amplifier may be able to deliver high output power, but as the load impedance increases, the output power may decrease, reaching a minimum value at the maximum load impedance. The load curve is often represented graphically, showing the output power versus the load impedance, and can be used to determine the operating conditions that will result in the best performance of the amplifier.

In summary, the load curve is a key parameter for the design and optimization of an amplifier with an RF choke, and provides important information about the performance and limitations of the amplifier under different load conditions.

各位不妨看一下，ChatGPT根本不懂使用RF choke所引起的問題，因為ChatGPT對兩個不同load curve的回答是一樣的，唯一做的事是將”with RF choke”這幾個字加入了第二個回答。這真是聰明，但使我感到非常不安，我的學生如果對某一個問題不懂，應該回答”我不懂”，絕不可以唬弄我。

我非常擔心教育界過分重視電腦的用途。我首先要講的是，學生的思考是相當重要的，我們絕對要鼓勵學生有獨立思考的能力，而不能在重大問題上完全跟隨別人的想法。我曾經用”人類面臨的重大問題”來問ChatGPT，它答得的確很好。如果一個偷懶的學生懶得自己思考就寫出論文，雖然學生可以應付老師，其實根本沒有學到什麼。

利用電腦所得到的資料也不見得是知識，因為對於一個很複雜的問題，電腦裡頭的資料也都是很簡短的。根據我的經驗，演算法很多的理論是不能藉由電腦搞清楚的，電磁學更加如此。我絕不相信任何人可以經由電腦搞懂電磁學。

更重要的是，我們在學習過程中一定會發現很多自己想不通的事，要得到答案，必須經過研究，也就是要經過思考，而絕對不能依賴電腦給我們的資料。在這種情況之下，資料是沒有用的。我非常擔心大學教授都在鼓勵學生用ChatGPT，其結果是，學生會寫出洋洋灑灑的論文，可是一問三不知。難怪有 些美國學校根本就禁止使用ChatGPT。

希望各級老師都還是要鼓勵學生會感到困擾，也鼓勵學生盡量地經由研究以及和老師的討論來去除困擾，而不是查一下電腦的資料。讓學生得到很多資料並不是最重要的事，作為老師，最重要的仍然是要使得學生知道如何經由思考得到學問。

要知道，學問和資料是兩回事，資料可以經由電腦獲得，學問都是經過思考得到的。