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How to raise AI Energy Consumption Awareness

The price of your lazy prompts

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1 Introduction

Artificial Intelligence technology has had a soaring increase from year 2020 and on, both on research and use. Mini Dall-E, a generative AI of images from a prompt had a great and viral impact on the web communities thanks to the low quality and hilarious images the users created with its aid. Some years afterward, that technology has been completely revolutionized by new AI tools like Midjourney, Dall-E Mini 3 for image generation and ChatGPT for basically everything.

Laws and Regulations on Artificial Intelligence is still developing and there has been ethic discussions about the originality of the works made from it, what effects will have on our society and how jobs will change accordingly.

Artificial Intelligence is a great technology that will and is already helping and relieving a lot of people, from creatives to engineers from their more tedious and repetitive works. However, its use should be regulated to respect copyrights, fair use, privacy and every other directive it will be applied to.

2 Energy Consumption

AI technology has been invented with the scope of reducing human, manual labor and assist humans on their work. To show some examples: the AI that reads X-RAY scans and is able to localize and predict tumor cells on human bodies, the AI that removes the background of a photo effortlessly with a click, an operation that would consume several minutes to a graphic designer.

Since the general release of AI chatbots and generative AI tools from human speech prompts as the already cited Mini Dall-E and nowadays ChatGPT and CoPilot, everyone can use AI daily. ⁽¹⁾ This new, free service is used by the average internet user not only for productive reasons but also for fun, entertainment and especially tasks that could be executed better in other ways or even completely avoided.

Nowadays AI chatbots are used for whatever reason, from the dumbest to the laziest. Some tasks an AI could receive are telling the weather forecast, replying to philosophical dilemmas, generating funny images, writing a guide on how to create and open a PDF file. All these examples are tasks that can be completed with a simple search on a browser like Google or Bing.

Asking a trivial question to an AI consumes, or better, wastes more electricity than a classic search. To spill some numbers, Microsoft AI CoPilot uses up to about 5Wh of electricity ⁽²⁾, the same amount of a LED lamp lit on for an hour. Considering US electricity net generation, the CO2 emissions of a 5Wh are about 1,95 grams ⁽³⁾.

With just a little more than 500 prompts, a kilogram of CO₂ will be added to the amount dispersed in the atmosphere. This kilogram multiplies very quickly just by thinking how many interactions are made with AI daily.

3 The Idea for Consumption Awareness

If this technology would be 100% powered by renewable energy this discussion wouldn't even be here, however Data center servers still requires a lot of energy for cooling and they contribute to 0,3% of the overall carbon emissions. ⁽⁴⁾

For this reason, we developed an idea to spread awareness about the energy consumed while using AI chatbots or search engines, in order to reduce the use, let's say misuse instead, of those tools for trivial, lazy, dumb or more generally less efficient reasons than a classic search. One way to do this is to show the user a counter with the energy they used every search or prompt. Just as Google already does with the number of results and the time it took to load them, a similar spot could be given to the consumption of electricity, eventually with an additional "click here for more information" redirecting to an article about how the search engine provides the energy used by the user.

In this document the focus was on how to reduce the use of AI for unnecessary tasks that could be done better and with less energy in other ways. These other ways could be either the user's own skills, knowledge that can be read on books or an information that can be read just through a simple search. We should not be lazy to use our own brain, which is the best natural intelligence, and use instead an artificial intelligence that might be give wrong answers, just as we do.

In any way, the energy spent for each search or prompt for useless, lazy, dumb questions or information is energy wasted, regardless of the amount. Be aware of your impact on the environment, even while surfing on the net.

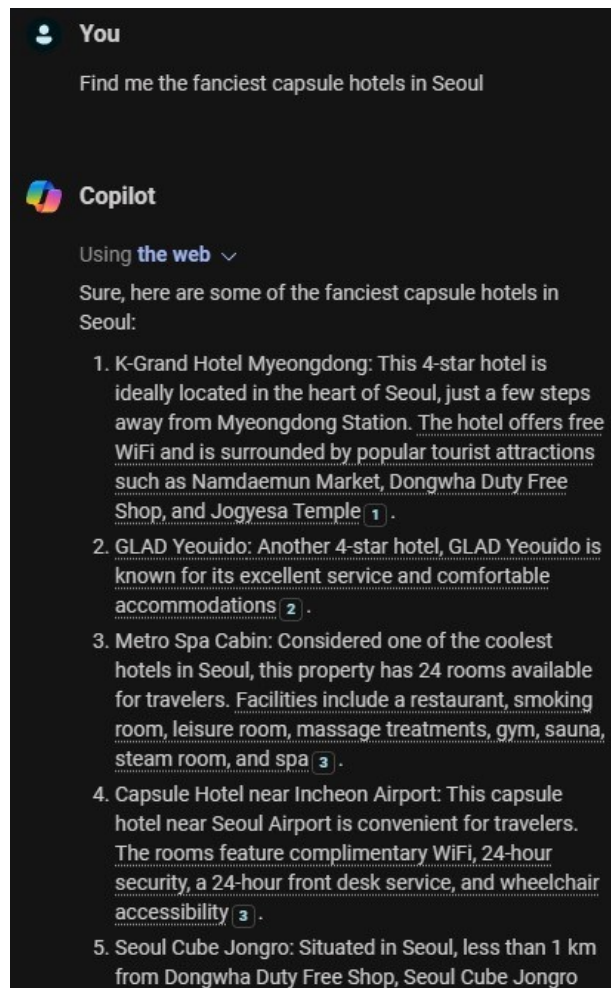
4 An example of AI energy waste

To really appreciate how AI can waste energy and time as well, an experiment was performed. Pretending to be interested in going to Seoul for a vacation, the idea was to search for the best capsule hotels in the city both with Google search engines and with CoPilot, Microsoft AI chatbot embedded in Microsoft Edge.

4.1 CoPilot search

Given the following prompt “Find me the fanciest capsule hotels in Seoul” to the chatbot, the user would expect a list of capsule hotels, a little description and a link to the site to book the room right away. Indeed, a list of 5 hotels appeared with their location and edges, however only one was an actual capsule hotel.

Assuming a 5Wh power consumption for a prompt, this resulted in only one capsule hotel.



4.2 Google search

The same search was performed on the common search engine Google. The input given was “Fancy capsule hotels in Seoul”. In this case the user would expect a list of capsule hotels, travel websites articles with a ranking, sponsored insertions about hotels and so on. Since Google has various features, a map with the location of various hotels appeared and below the list with photos of the hotel rooms. However, also in this case none of the few first results was a capsule hotel. But the difference from the AI is that Google loaded more than 290.000 results of “capsule hotels in Seoul”. Therefore, assuming a Google search use up to 0,3Wh, it could get potentially 290.000 capsule hotels, instead of CoPilot that could get potentially only 5 (actually only one), consuming 16 times more.

Fancy Capsule Hotels in Seoul

All Images Lodging Places sites Videos More Tools

Dates Guests Top-rated Cheap For tonight Best Budget Deals

About 290,000 results (0,74 seconds)

Capsule Hotels | Seoul, South Korea

Sun, Apr 21 - Mon, Apr 22 · 2 guests

Dormy Inn Seoul Gangnam from €115
4.5 ★★★★★ (1.2K) · 4-star hotel
Casual hotel with an indoor bathhouse
Spa · Free Wi-Fi · Website

Roynet Hotel Seoul Mapo from €89
4.5 ★★★★★ (406) · 4-star hotel
Casual hotel with a restaurant & a gym
Fitness center · Free Wi-Fi · Website

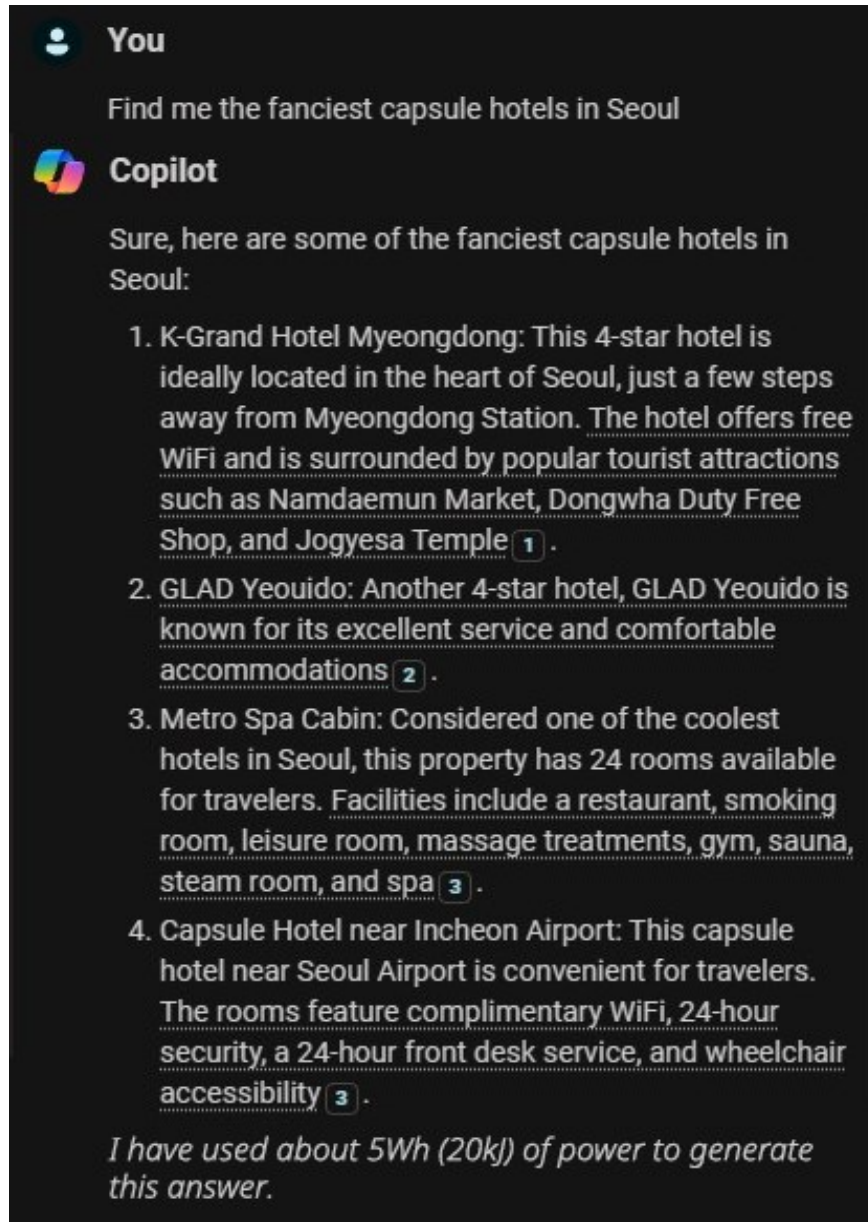
Banyan Tree Club & Spa Seoul from €387
4.5 ★★★★★ (2.1K) · 5-star hotel
Chic hotel with fine dining & a posh spa
Pool · Spa · Website

4.3 A new feature

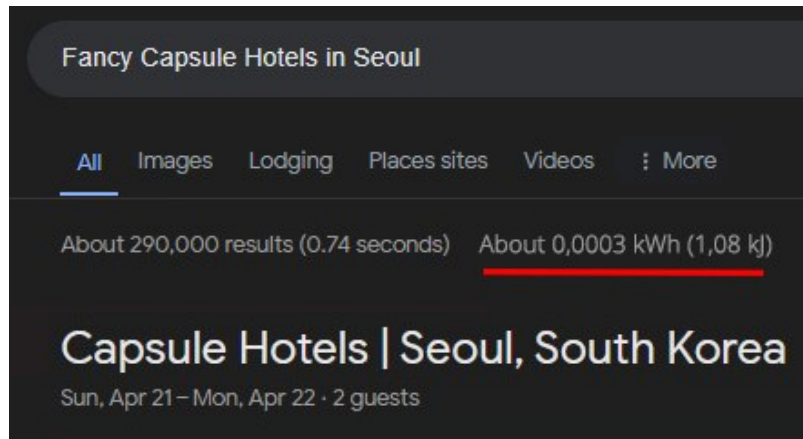
The idea here is to add a text slot that shows the energy consumption of the current search or even the entire surfing session, both in case of a classic browser and AI chatbot.

Here below there are two examples of implementation of the idea:

Picture 1. Microsoft Edge CoPilot AI prompt and reply. At the end of the answer, there's an additional system phrase that reports the amount of energy used for generating that answer.



Picture 2. Google Search tab, additional spot for energy consumption near the already existing results counter.



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