What Do We Know (and Not Know) About AI’s Environmental Impact? Peter Pavlík Featured in a Student Documentary

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Artificial intelligence is increasingly associated with questions about electricity and water consumption. Although its environmental impact is being discussed more than ever before, we still lack precise data on the footprint AI actually leaves behind. This is the topic of a short student documentary on artificial intelligence and the environment created by Gabriel György from the Private School of Applied Arts of Animated Production. The film also features our researcher, Peter Pavlík.

We Still Don’t Know the Exact Numbers

Today’s discussion about AI’s resource consumption is largely based on estimates. According to Peter, only the operators of data centres and large AI models have access to accurate information about electricity consumption, and they generally do not make it public.

“All major AI models are currently operated by private companies that have little incentive to tell the public how much energy they consume.”

Because this information is not publicly available, current estimates of AI’s environmental impact are based on incomplete data.

AI’s Impact Is More Than Just One Prompt

When assessing AI’s environmental footprint, it is not enough to look only at the energy required to generate a single chatbot response. Peter points out that we need to consider the entire lifecycle of an AI system, from manufacturing the computing hardware and training the models to their everyday use by millions of people.

One of the questions, for example, is how much of the total energy consumption comes from training a model compared to its daily use.

It Also Depends on Where the Energy Comes From

Data centres generate large amounts of heat that need to be removed. This is often done using water, which then evaporates. That does not mean the water is permanently lost, but in regions affected by drought, it can place additional pressure on local water resources.

This is why the location of data centres also matters. Cooler regions with renewable energy supplies offer advantages because they require less cooling.

AI Can Also Be Part of the Solution

The environmental debate around AI often focuses only on its energy consumption. However, Peter points out that artificial intelligence can also significantly reduce the computational demands of certain tasks.

As an example, he highlights weather forecasting models, which he and other researchers are working on. While traditional weather forecasting models rely on some of the world's most powerful supercomputers, newer AI models can achieve even more accurate forecasts while requiring far less computing power.

"We already have AI models that can outperform these forecasts while running on just one or two GPUs for only a few seconds."

Similar approaches could help reduce energy consumption in many other fields in the future.

Where Can We Make a Difference?

Peter also points out that much of the demand for computing power is created by the way we use AI every day. He therefore recommends using it where it provides real added value and avoiding trivial tasks that do not require the computing power of large language models. A single request may not make a noticeable difference, but when millions of similar requests are generated every day, their combined energy consumption can become significant.

According to Peter, the solution is to use AI thoughtfully while also encouraging greater transparency from the companies that develop and operate these systems.

"Collective action will have a much greater impact than personally boycotting AI. For people in Slovakia, the most sensible approach is probably to vote for representatives to the European Parliament who care about this issue and are able to push for the necessary legislative changes."

The environmental impact of artificial intelligence therefore cannot be reduced to a single number. It depends on the entire lifecycle of AI models, how they are used, and how much information companies choose to disclose about their operation. According to Peter, greater transparency would help create a more informed discussion about AI's real environmental impact and the areas where it can also deliver positive benefits.

You can watch the full documentary **here**.

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