

CableLabs®

Technology and Human Behavior

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What technology enables

In the beginning...



Hand made Axe, .5 million years ago,

Today we surpass most things in the natural world

Moving, calculating, planning, interacting with others, economic transactions, a global network, consensus building, information spreading,...



Faster is not always better

The view from a regular train



Faster is not always better

The blur from a fast train



Decisions faster than a human reflex (self driving objects, instruments of war, etc)

And now, another discontinuity

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Artificial Intelligence becoming real.

Generative AI

Large Language Models: Truly revolutionary.

Text, video and image generation. Novel Outputs

How Revolutionary?

Examples of creative behavior:

Literature:

GenAI stories are on an average better written, and more enjoyable, especially among less creative writers.

However, generative AI-enabled stories are more similar to each other than stories by humans alone.

These results point to an increase in individual creativity at the risk of losing collective novelty.

This dynamic resembles a social dilemma: With generative AI, writers are individually better off, but collectively a narrower scope of novel content is produced.

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How Revolutionary?

Examples of creative behavior:

Science:

An ideas generator powered by artificial intelligence (AI) came up with more original research ideas than did 50 scientists working independently, according to a preprint posted on arXiv this month.

The human and AI-generated ideas were evaluated by reviewers, who were not told who or what had created each idea.

The reviewers scored AI-generated concepts as *more exciting* than those written by humans, although the AI's suggestions scored *slightly lower on feasibility*.

And now the sobering news

Hitting a roadblock.



Are GenAI Systems Economically Feasible?

The costs of building and using bigger models are spiraling, and breakthroughs are getting harder.

The energy used to train OpenAI's GPT-4 model could have powered 50 American homes for a century. (Three Mile Island restarting)

The big models cost \$100m to train; the next generation could cost \$1bn, and the following one \$10bn. (The Economist)

To answer a query costs anything from \$2,400 to \$223,000 (Ex: summarize the financial reports of the world's 58,000 public companies)

These costs, when added up, can exceed the cost of training.

Another Roadblock

Training AI models on AI-generated text quickly leads to the models churning out nonsense, a study has found.

This cannibalistic phenomenon, termed model collapse, could halt the improvement of LLMs, as they run out of human-derived training data and on increasing amounts of AI-generated text pervade the Internet.

Brave New World

New ideas and approaches are needed.

Hardware at the center of the progress!

But there is plenty to celebrate

Thank You!