

Gener(AI)ting the future



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AI: THE NEW ELECTRICITY



Dr. Ng is the founder of LandingAI, which provides a visual AI platform, and the managing general partner of AI Fund, a venture studio that supports entrepreneurs in building AI companies. He is also the leader of DeepLearning.AI, an education technology company he founded to

provide AI training. He is the chair and co-founder of Coursera, an open online course provider, of which he was co-CEO until 2014. In addition, he is an adjunct professor at Stanford University. Prior to this, he was chief scientist at the Chinese tech multinational Baidu and founding lead of Google's Google Brain deep learning project. He sits on the board of directors of Amazon.

LANDINGAI – THE REVOLUTION OF UNSTRUCTURED DATA ANALYSIS

What is the focus of LandingAI?

LandingAI provides a platform that makes visual AI intuitive and accessible to use. We have already seen the text-processing revolution with ChatGPT and large language models (LLMs). I think we are at the very beginning of the image-processing and analysis revolution. And I do not mean just image generation, but unstructured data analysis.

Until now, writing software to help computers “see” has been difficult. Self-driving cars, for example, are not yet reliable in detecting other objects around them. In manufacturing, there has been a lot of work to build valuable inspection systems. Today, cameras are ubiquitous. Computers will be able to interpret images with increasing accuracy. I think the image-processing revolution might be as big as the text-processing revolution.

Are there specific industries where image processing can have a significant impact?

We started in manufacturing and industrial automation, focusing on visual inspection. But now applications span multiple industries. For example, life sciences involve a lot of analysis of microscopic images on slides. There are many applications in geospatial aero imagery and retail, too. A more diverse set of industries than I would have imagined possible a few years ago applies general-purpose image-analysis algorithms nowadays.



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HOW AI WILL BECOME AS PERVASIVE AS ELECTRICITY



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Where do you believe we stand currently in the AI development cycle?

Over the past 15 years, progress has been tremendous, with deep learning making huge strides. This has allowed us to "label" things. For example, given an ad, we can label who is most likely to click on it. Given a shipping route, we can label it with the estimated fuel consumption per run. There are so many use cases across all industries.

And in the past couple of years, generative AI has taken off as well. In another five years, I think we'll look back at where we are now and see this as the early stages.

You referred to AI as "the new electricity." Can you expand on that analogy?

AI is a general-purpose technology, meaning that, like electricity, it's useful for many things. If I were to ask "what is electricity for?" it would be difficult to answer that question, because it's so pervasive – and the same goes for AI. AI's uses range from online advertising to analyzing medical images to arrive at a diagnosis, to copyediting, to fact-finding. Potentially, there are thousands of other applications. In the early days of electricity, no one dreamed of all the things we can do with it now. With AI, the process is underway, but it will take many years to identify and build all the use cases to which AI can be very effectively applied.

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Executive Conversations

Are there industries where AI adoption is more pronounced?

Industries that use more digital records, and to which data use is integral, with a culture of data-driven decision-making, are able to harness AI more effectively. Over the past 20 years, almost all industries have become increasingly digital. Those that have progressed further with digitization seem to be adopting AI faster. Sectors such as healthcare and financial services are ahead in adopting AI. However, in today's digital world, I think all industries will get there quite quickly.

Can you share any innovative AI use cases you find particularly compelling?

Finding the best use case for AI is a bit like finding the most innovative use of electricity – it is the basis for so much. We are working on a wide variety of interesting use cases. For instance, AI-driven relationship mentoring and addressing societal issues such as loneliness. AI also has immense potential to revolutionize traditional processes.

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Are there barriers to greater AI adoption?

One of the biggest is inadequate training and education. There are other barriers, concerning data, culture, and governance. But when the team is trained to understand AI, it can solve all of those problems. So, one of the things I did recently was launch a course, *Generative AI for everyone*, on Coursera. There are quite a few companies whose entire leadership teams are taking that course. If the leadership, followed by the rest of the organization, can really understand the potential of AI, that can unlock a lot of value.

AI FOR CLIMATE ENGINEERING

What about AI's role in sustainability and climate change mitigation?

One area we must study seriously is sunlight reduction, which is also called climate geoengineering via solar-radiation management. If we use high-altitude stratospheric aerosol injection, that could effectively put a parasol around the planet to reflect sunlight and cool us down. The science of sunlight reduction methods is being developed. So, I think we do not fully understand all the impacts if we were to take this action.

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We are now able to train very large foundation models to predict more accurately the effects of stratospheric aerosol injection. Given the world's collective inability to reduce CO2 emissions in the way we know we need to, I think it is past time to take climate engineering more seriously. I think AI, especially large AI foundation models of climate, have a large role to play in that.

AI AND SOCIETY

How do you foresee AI impacting the labor market?

People have talked about AI replacing jobs, which is an important conversation. However, from a business perspective, a more useful framework is task-based analysis to figure out which tasks AI can augment or automate.



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Breaking down the role of, say, a call center operator into its constituent tasks – answering the phone, sending text messages, pulling up customer records, mentoring less experienced service agents – you can then systematically figure out where to apply AI to enhance productivity. While AI will replace those jobs that are completely or largely automatable, overall job replacement may be less than people fear. For many jobs, AI will only automate or augment 20-30% of tasks. So, there's a huge productivity boost, but people are still required for the remaining 70% of the role. For most jobs, it will be only a subset of tasks that AI can really make significant changes in the near future.

There has been much debate about AI's broader societal impact, with concerns voiced about misinformation and wealth distribution. How valid are these concerns and how can we mitigate the risks?

I think the fears of AI wiping out humanity are science-fictional. That is not going to happen. But there are some risks to which we should pay attention. If AI-generated media pollute our information ecosystem, for example, what are the implications for democracy? We have to ensure that people have a sufficient understanding of AI. The other thing we should pay attention to is whether the significant wealth that AI will create can be fairly shared. This includes making sure we avoid discriminating against certain subgroups, but also, more broadly, how do we make sure that everyone benefits?

How can society prepare for the impact of AI to prevent societal disparities?

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Until legislators and citizens attain a broad understanding of AI, governments are vulnerable to powerful lobbying by special interests, which is what I am seeing today, certainly in the US, as well as some other countries. Unfortunately, because general knowledge of AI is not widespread, I see many ill-thought-out regulatory proposals, both in the US and in Europe. It is crucial that lawmakers develop a good understanding of AI.

What is your view on LLMs versus small language models (SLMs)?

I think both will be important. For the most complex reasoning tasks, a large LLM with many parameters is much more effective. But if you want a grammar checker, then you do not need a trillion-parameter model trained in science, philosophy, and ancient history. A SLM works just fine for this sort of task. Also, there are a lot of use cases for SLMs that can run locally, on-device, for reasons of privacy and security. I'd even go further and say that there's a strong incentive for PC manufacturers to encourage users to upgrade their computers. AI gives a very meaningful reason for people to upgrade their PCs now.

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THE FUTURE OF AI

Do you see a future where AI is capable of writing really good code?

I hope we get to see artificial general intelligence (AGI) within our lifetimes. I do not know if we will. And if we do get there, certainly, it will be able to write code much better than today. However, for the near future, I think more people should learn to code.

I advise high school and college students to learn to code. With AI, it's easier and cheaper than ever before to code, and the return on investment (ROI) is also higher. Someone who knows how to write code, set up a code prompt, or call an LLM, can accomplish much more than someone who only knows how to use a web user interface for an LLM. And the fact that AI can help us with our coding has also made it easier to create more value.

What would you consider the ideal scenario for AI development?

Firstly, I hope a lot more people receive AI training to spread the benefits of the tech as widely as possible. Secondly, with AI as a very powerful general-purpose technology, we need people from all industries to discover the use cases with the highest potential for AI application, and then do the work to build them out. A lot of media attention goes to the technology or the companies providing AI tools, but it's in the application of AI that is where we will see the real success stories.

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