



Opportunities in AI – 2023 by Andrew Ng

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Dr Andrew Ng

1. **Founder of DeepLearning.AI & Landing AI**

AI – Leading initiatives in AI development and application.

2. **Co-Founder & Chairman of Coursera** –

Revolutionized online education through MOOCs.

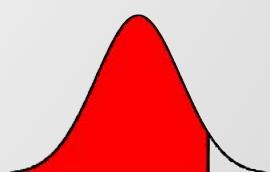
3. **Former Chief Scientist at Baidu** – Led a 1,300-person AI group and shaped global AI strategy.

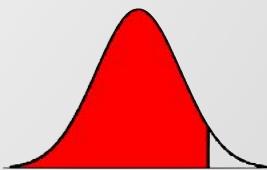
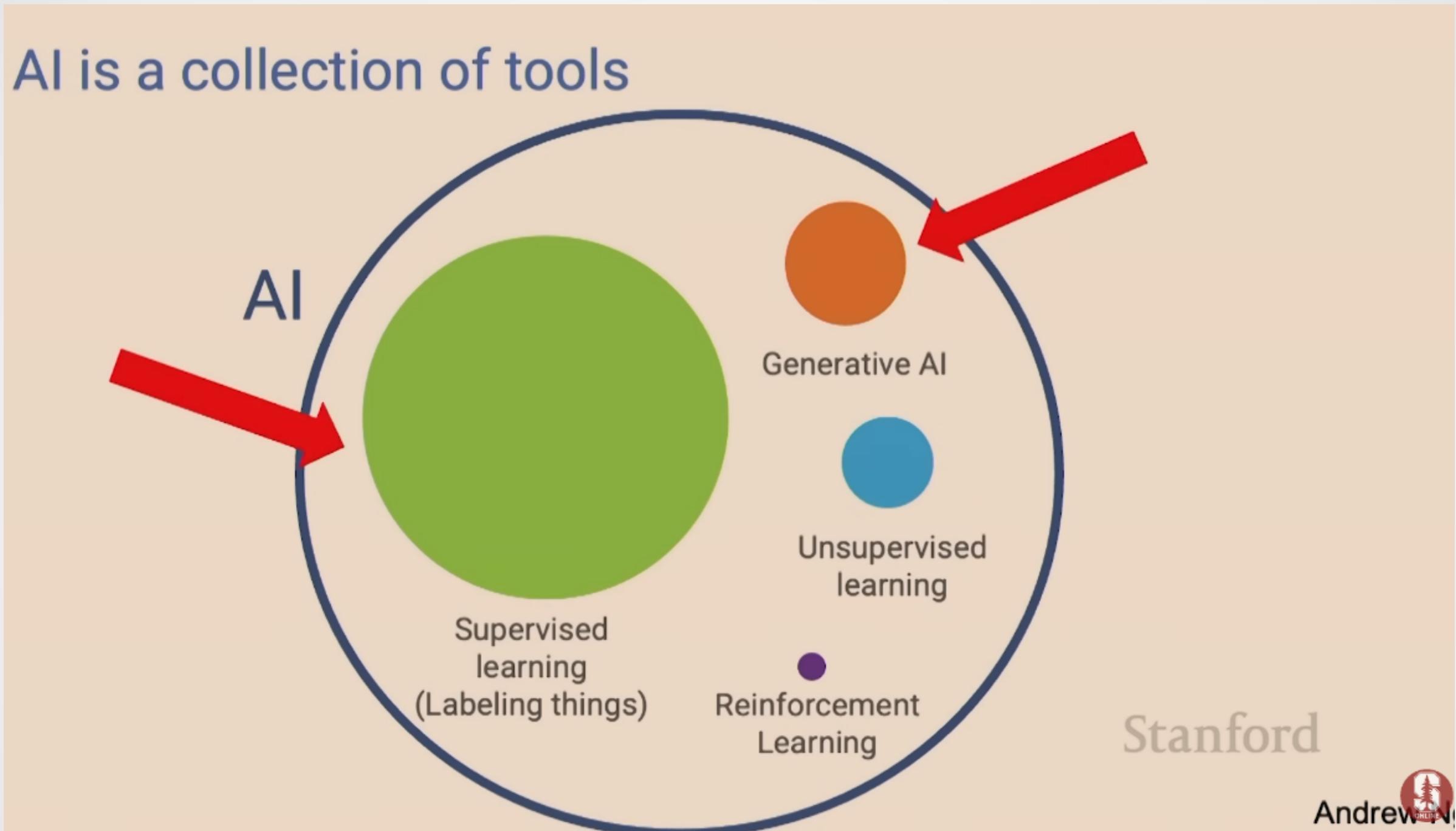
4. **Google Brain Founding Lead** – Pioneered significant advancements in AI research at Google.

5. **Time100 AI Honoree (2023)** – Recognized as one of the world's most influential figures in AI.



<https://www.andrewng.org/>





Supervised Learning (labeling things)

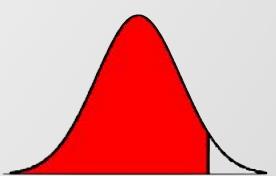
Input → Output

A B

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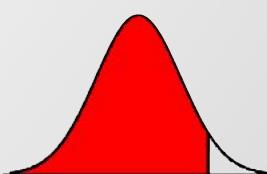


Supervised Learning (labeling things)

Input (A)	Output (B)	Application
Email	Spam? (0/1)	Spam filtering
Ad, user info	Click? (0/1)	Online advertising
Image, radar info	Position of other cars	Self-driving car
Ship route	Fuel consumed	Fuel optimization
Image of phone	Defect? (0/1)	Visual inspection

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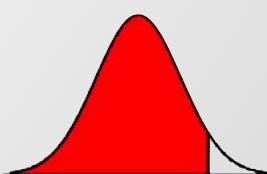


Example: Restaurant reviews sentiment tracking

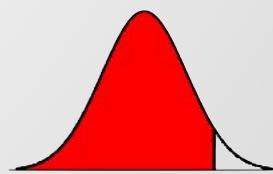
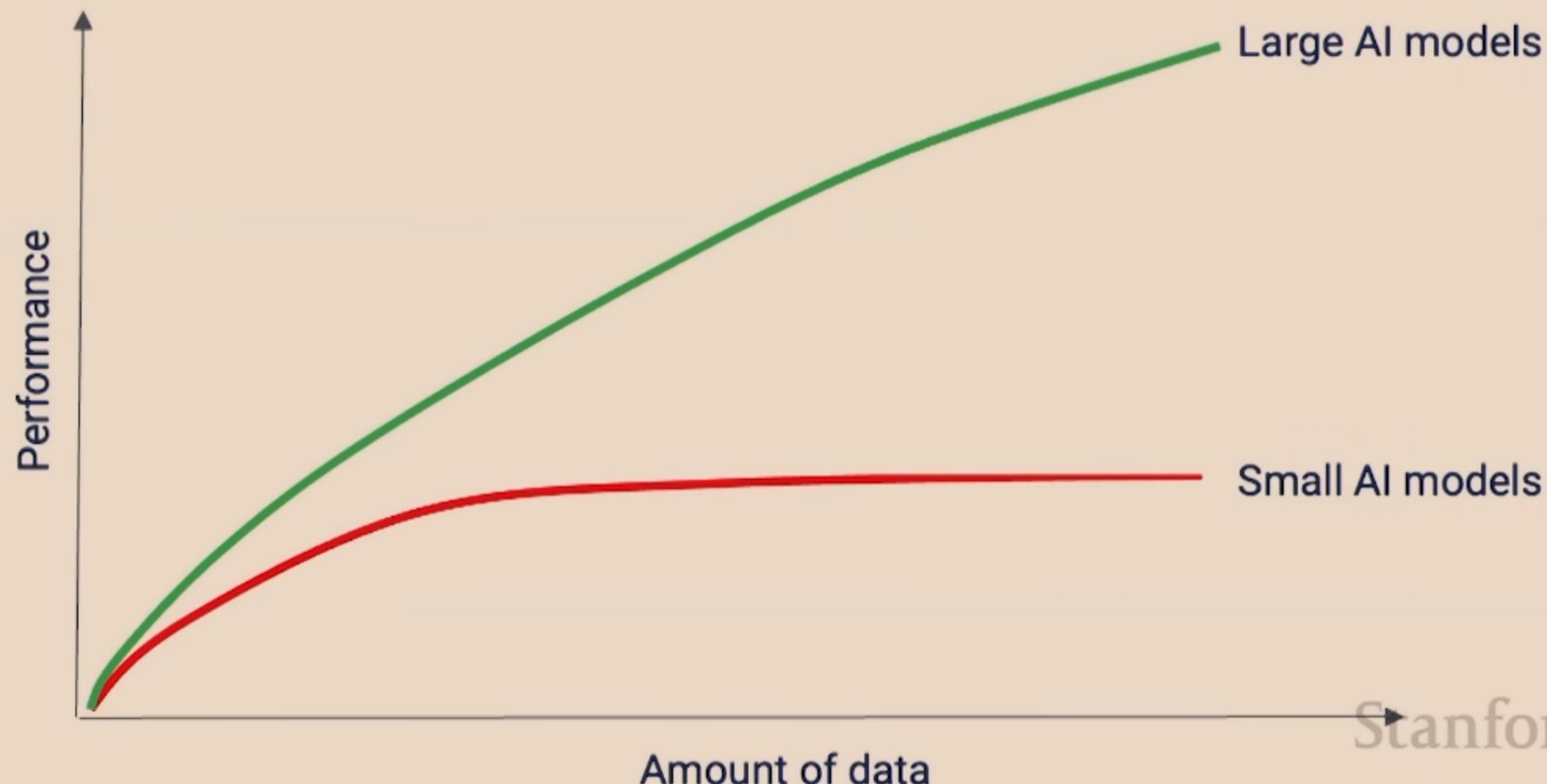
Input (A)	Output (B)
The pastrami sandwich was great! The meat was tender and perfectly balanced by the sauerkraut.	Positive
Service was slow and the food was so-so.	Negative
My favorite chicken curry. Yum!	Positive



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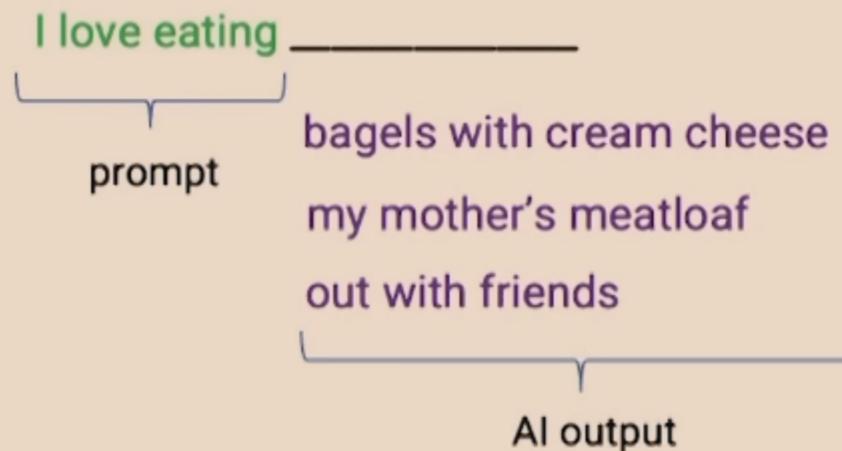


2010-2020: Large scale supervised learning



This decade: Generative AI

Text generation process



How it works

Generative AI is built by using supervised learning ($A \rightarrow B$) to repeatedly predict the next word.

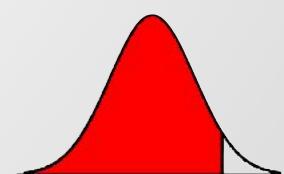
My favorite food is a bagel with cream cheese and lox.

Input (A)	Output (B)
My favorite food is a	bagel
My favorite food is a bagel	with
My favorite food is a bagel with	cream

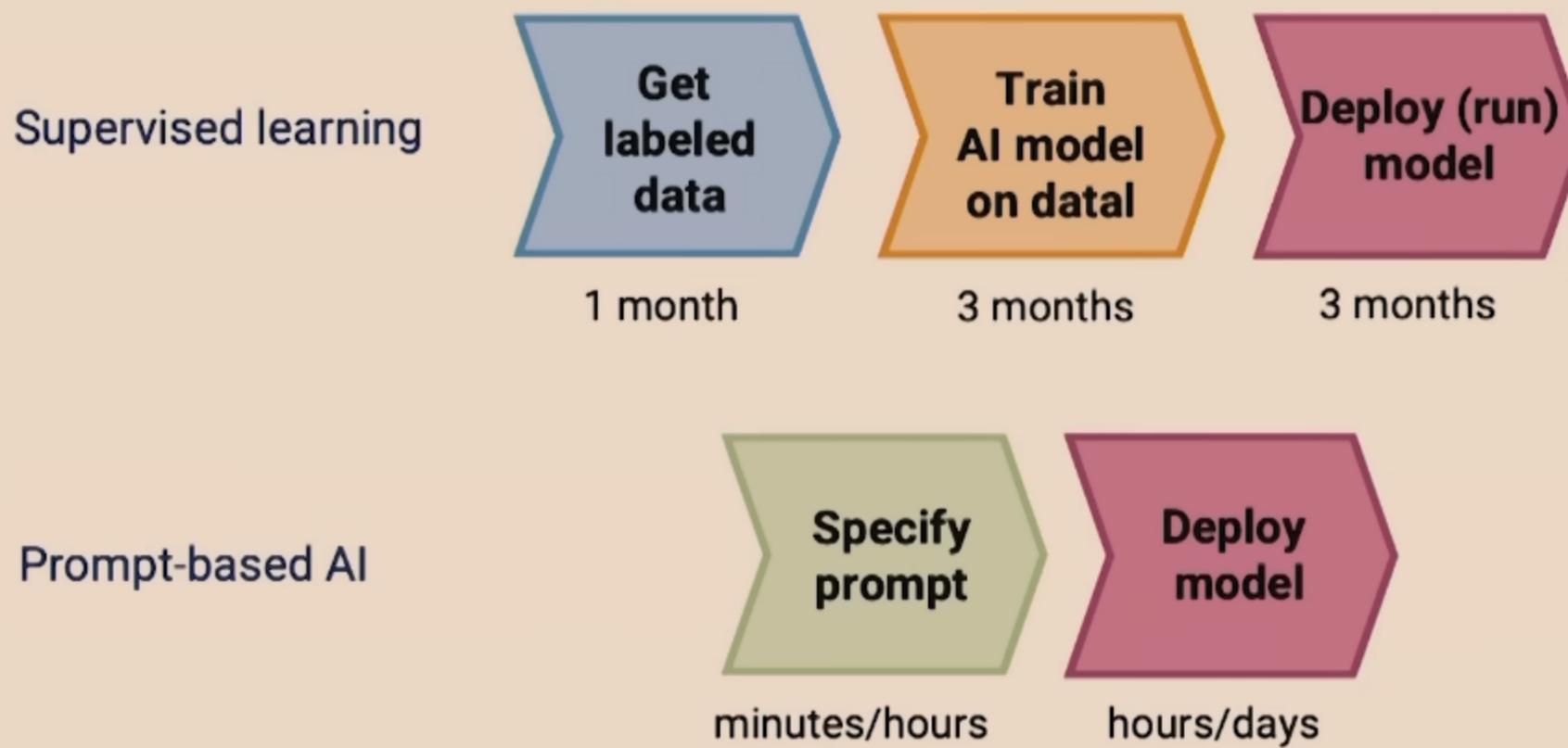
When we train a very large AI system on a lot of data (hundreds of billions of words) we get a Large Language Model like ChatGPT.

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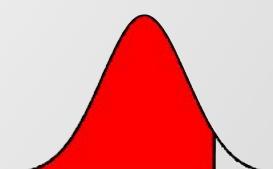
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Prompting is revolutionizing AI application development



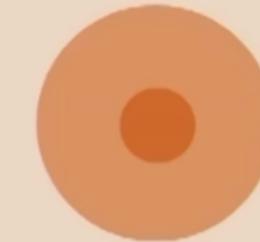
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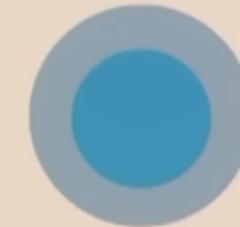
Value from AI technologies: Today → 3 years



Supervised learning
(Labeling things)



Generative AI



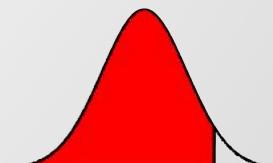
Unsupervised
learning



Reinforcement
Learning

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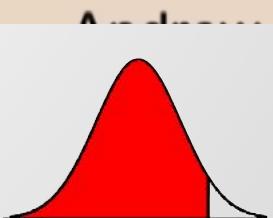
AI technologies are general purpose technologies

- General purpose technologies are useful for many tasks.
 - Massive value remains to be created using supervised learning (labeling things).
 - Generative AI is another major tool, creating even more opportunities.
- There will be fads along the way. Lensa revenue:



[Twitter @SashaKaletsky]

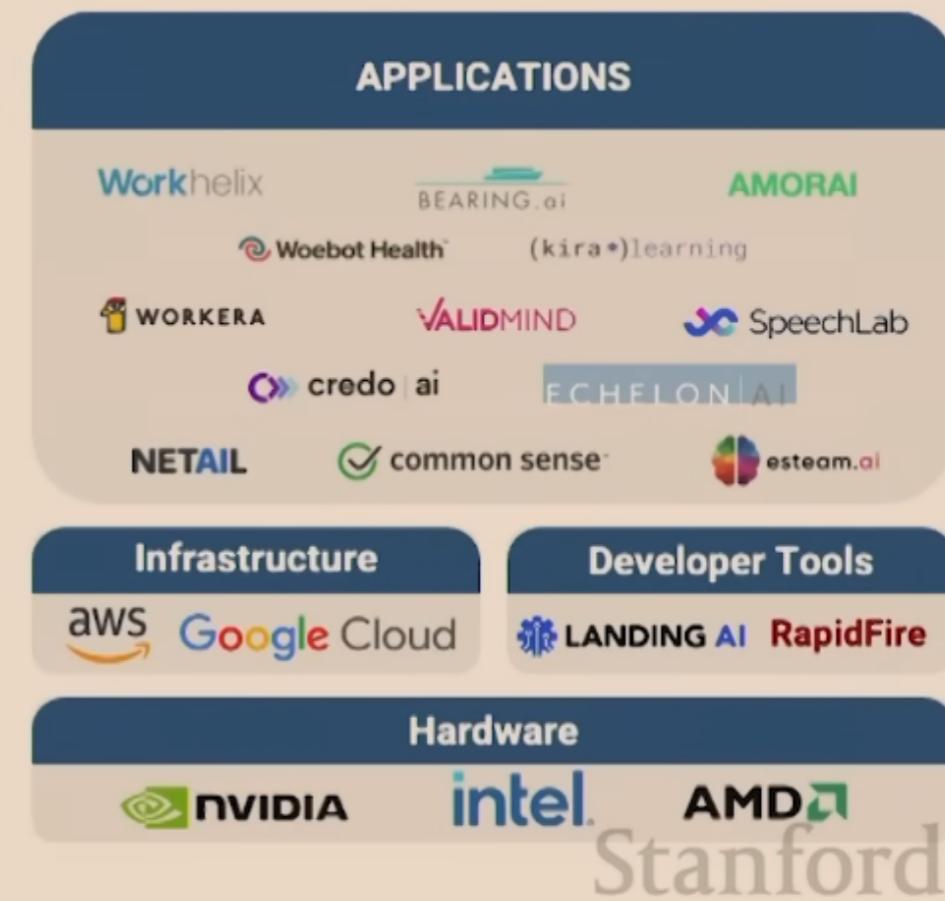
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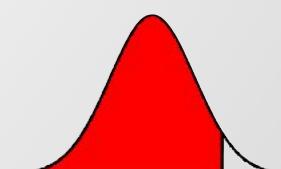
Opportunity from a new general purpose technology

- Many valuable AI projects are now possible. How do we get them done?
- *Starting new companies is an efficient way to do this.*
- Incumbent companies also have opportunities to integrate AI into existing businesses.

The AI stack

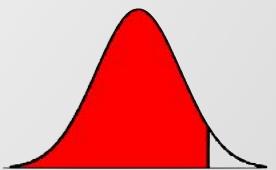


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AI startup: Bearing.AI

- requestor : Mitsui cargo company
- goal : use AI to make ships more fuel efficient
- expertise: CEO for the project, AI tech



Process for building startups

Ideas	Validate Stage 1	Recruit CEO Stage 2	Build w CEO Stage 3	Pre-Seed Growth Stage 4	Seed, Growth, Scale Stage 5
	1 month Market & technical validation by AI Fund team.	2 months Recruit CEO to build with us ("Founder in residence").	3 months Deep customer and technical validation. Build prototype.	~12 months \$1M pre-seed. Hire key executives. Build MVP. Get early customer traction.	indefinite ~\$2-5M seed funding. Startup graduates and is well on its way.


BEARING.ai

Green shipping powered by AI



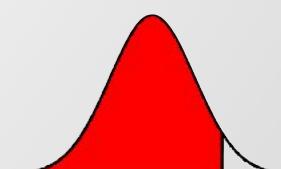
Dylan Keil

AI technical expertise is important for this process:

- Accurate technical validation. (Is this feasible?)
- Ensure AI tech is built quickly and well.
- Build a strong technical team.

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Process for building startups: Concrete ideas



Not concrete:

Apply AI to financial services. (Or logistics, supply chain...).

Concrete idea:

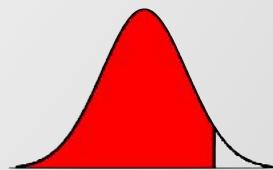
BuyGPT eliminates commercials by automatically buying every product in every ad, in exchange for not having to see any ads.

Concrete ideas:

- Can be validated or falsified efficiently
- Gives clear direction to execute
- Often from a subject matter expert who's deeply thought about a problem



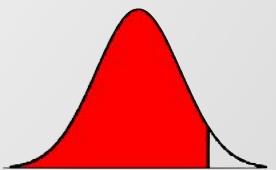
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Responsible AI

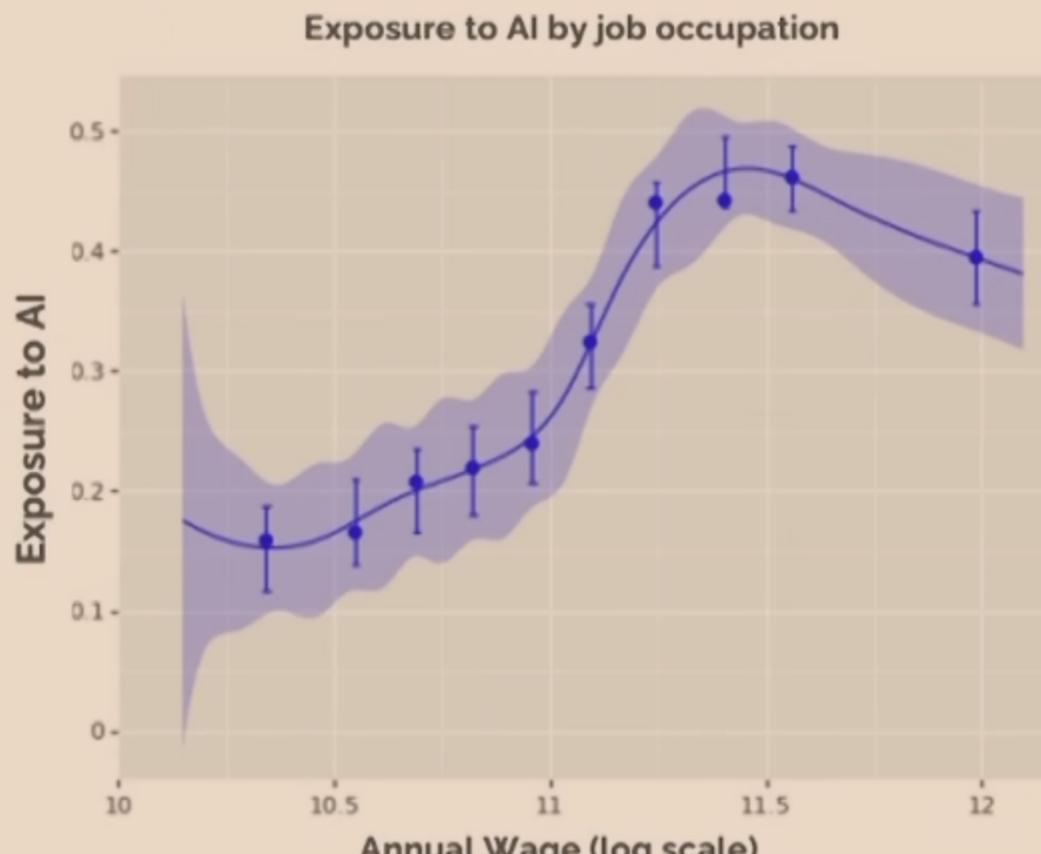
- My teams work only on projects that move humanity forward.
- For example, we kill projects that are otherwise financially sound on ethical grounds.

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Risks of AI

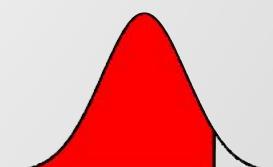
- AI today has problems with bias, fairness, accuracy, But the technology is improving quickly.
- AI will disrupt many occupations.



[Credit: Eloundou et al., 2023]

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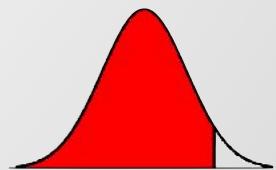


Risks of AI

- Artificial General Intelligence (AI that can do anything a human can do) is still decades away.
- AI creating extinction risk for humanity is wildly overhyped.
 - Human society has ample experience steering very powerful entities (such as corporations and nation states).
 - AI develops gradually, and the "hard take off" scenario (where AI suddenly achieves superintelligence overnight) is not realistic.
- AI is an important piece of the solution to the real existential risks to humanity (the next pandemic, climate change, ...).

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- if you want humanity to survive and thrive
 - rather than slowing AI down (some people propose)
 - we should make AI go as fast as possible
-
- AI as a general purpose technology
 - creates lot of new opportunities
 - We should go and build those concrete use cases

