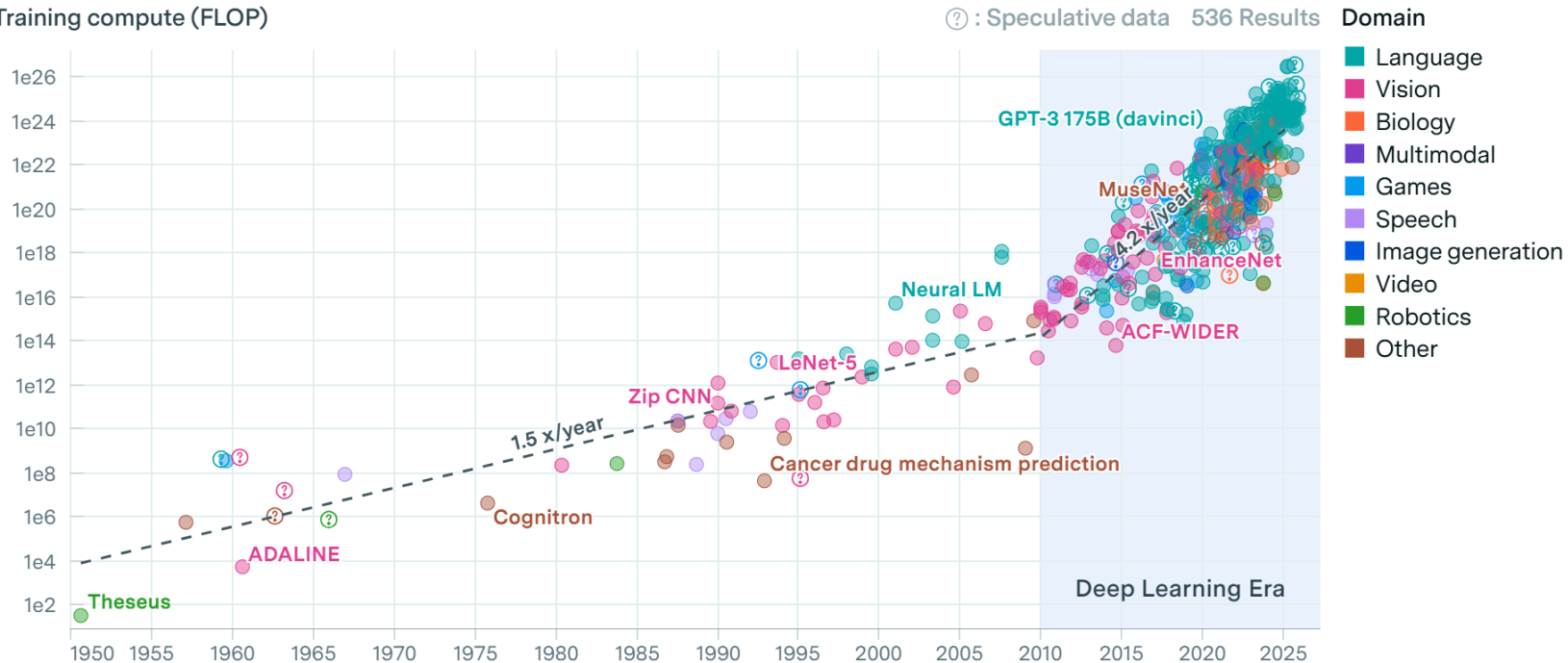


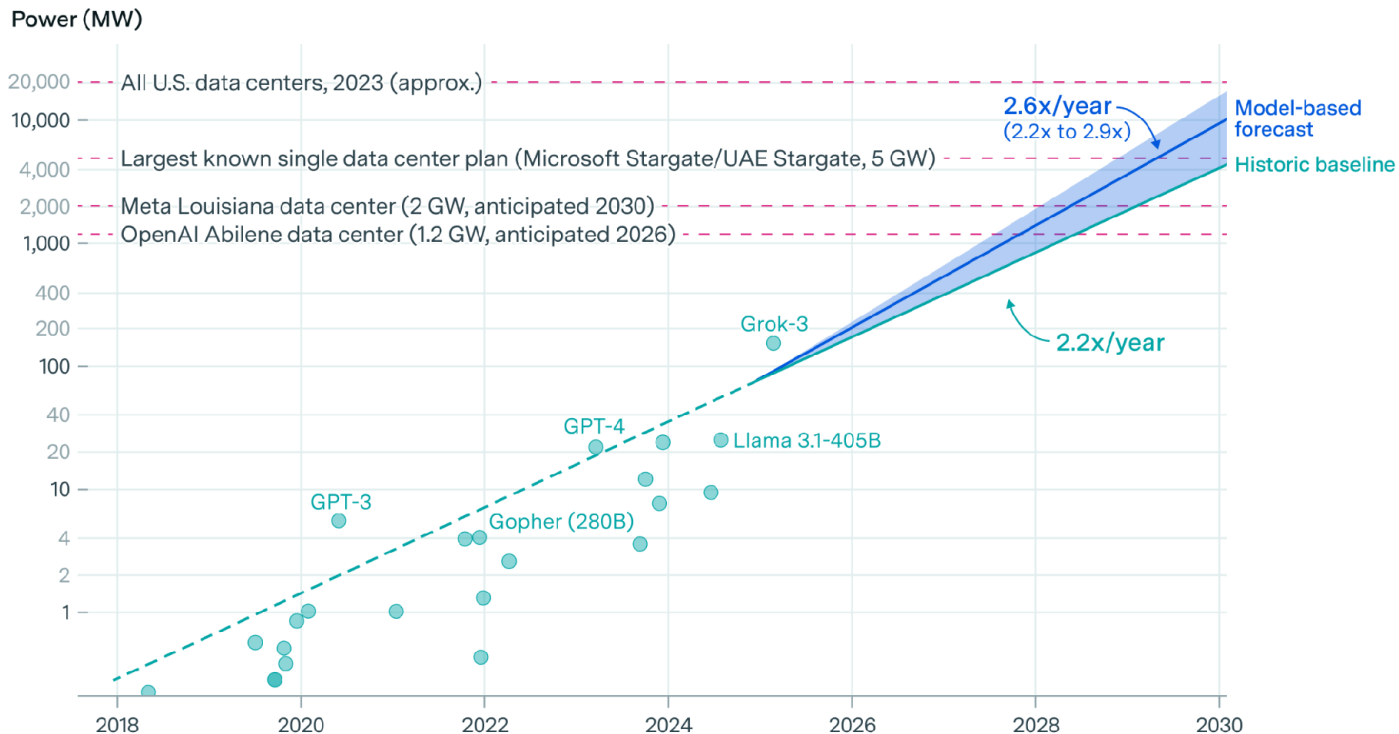
# Sustainability of AI

# State of AI-fairs

Training compute (FLOP)



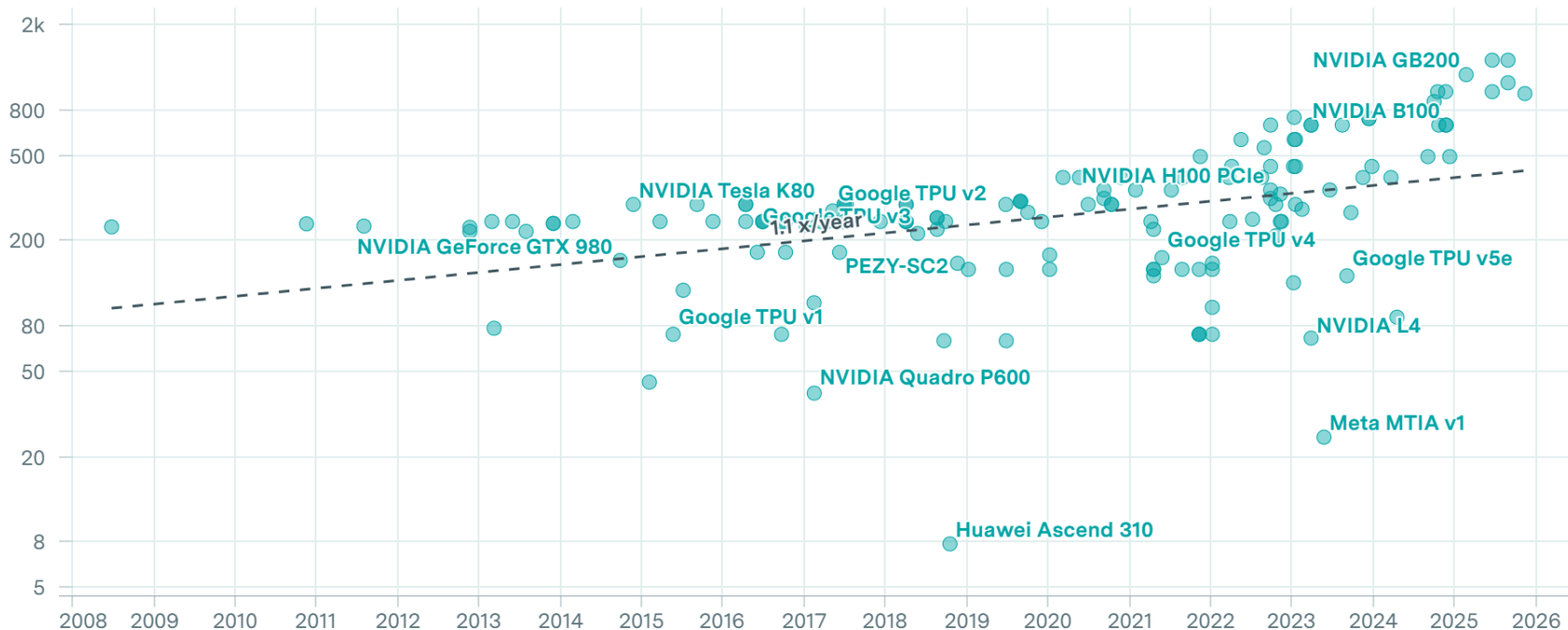
## State of AI-fairs



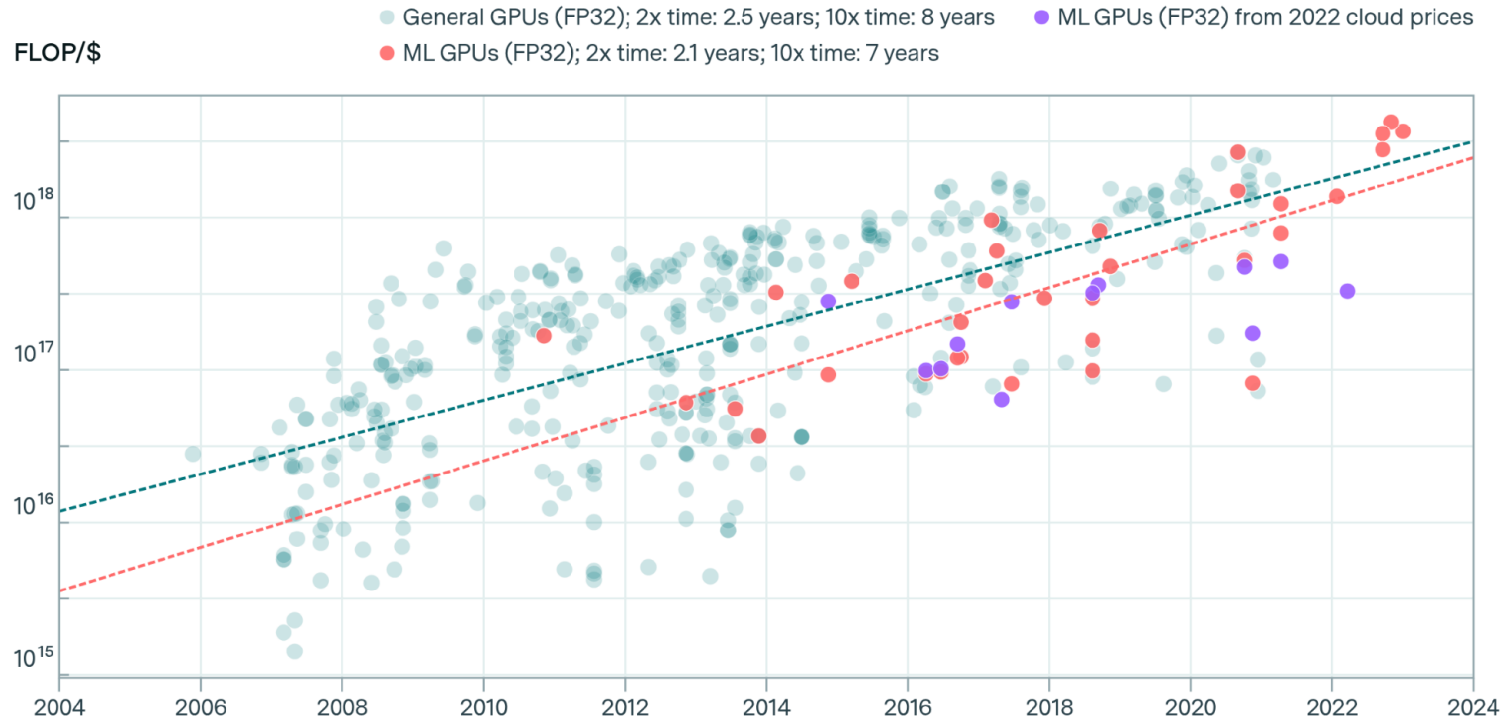
# State of AI-fairs

Power draw (W)

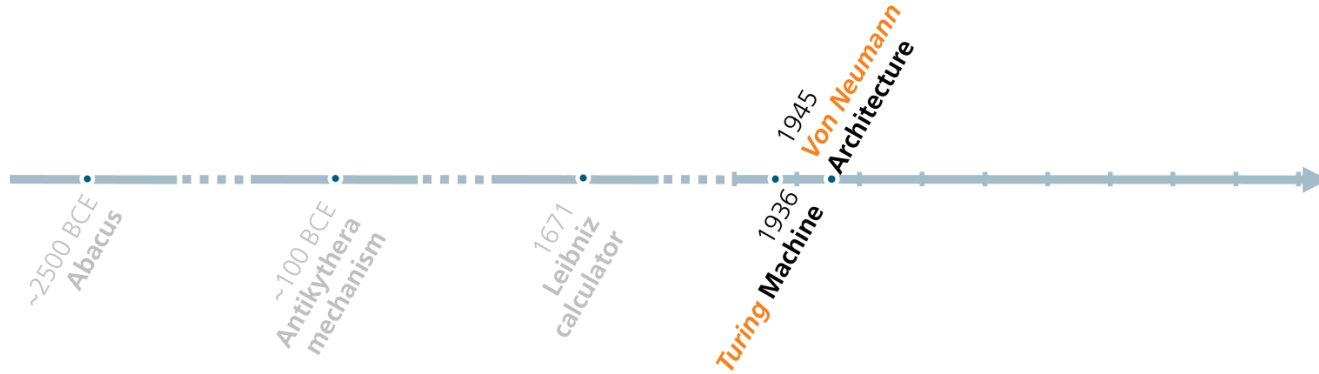
146 Results



# State of AI-fairs



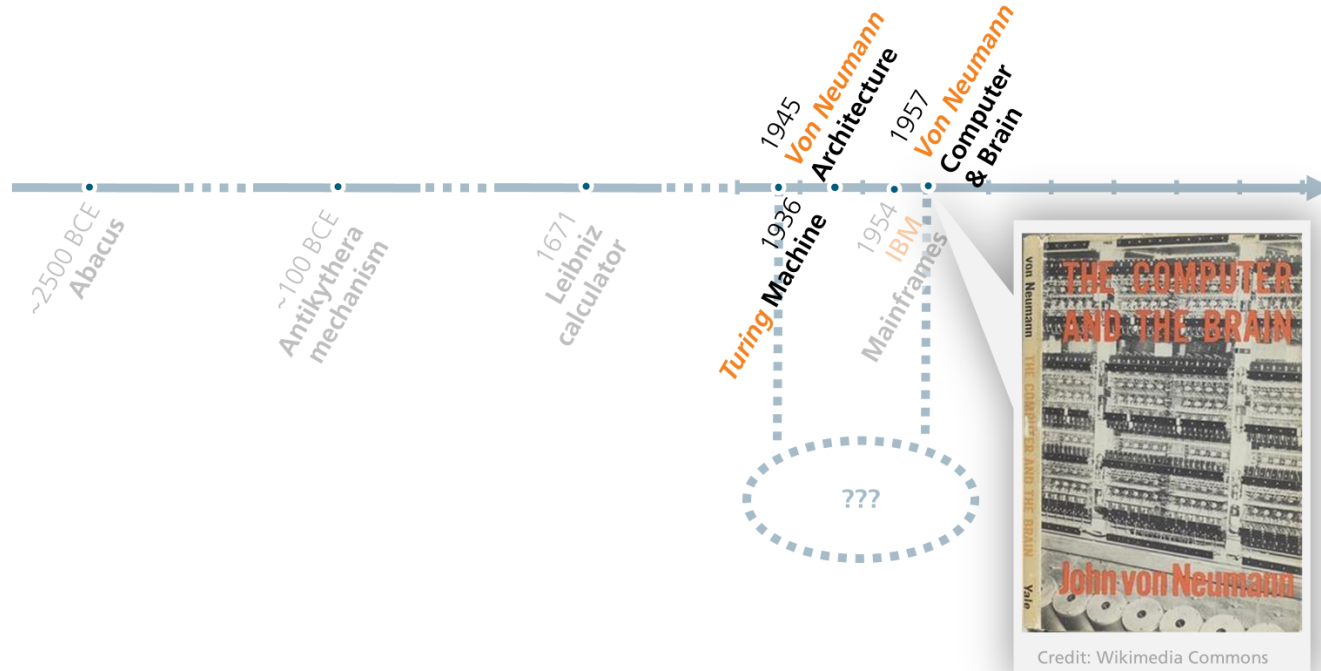
## The road of AI from "compute frugality" to "lavish opulence"



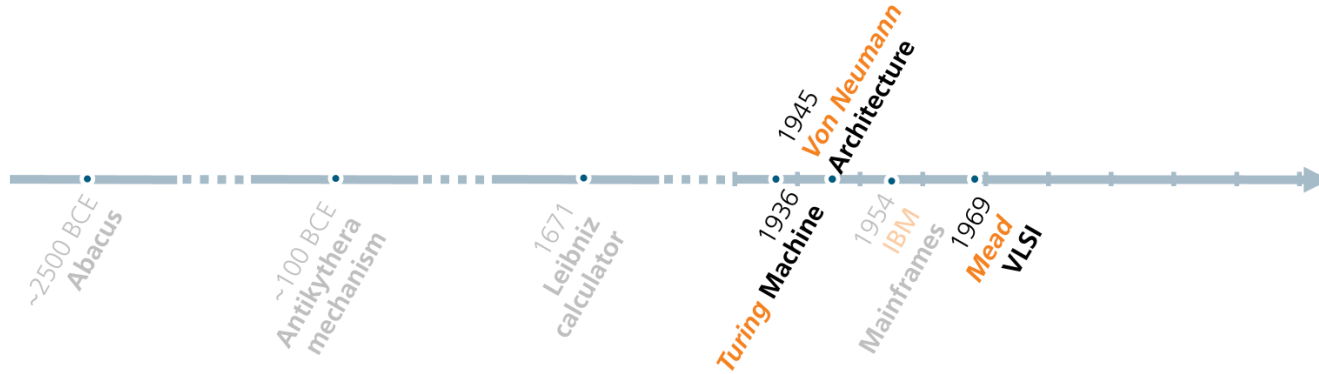
## The road of AI from "compute frugality" to "lavish opulence"



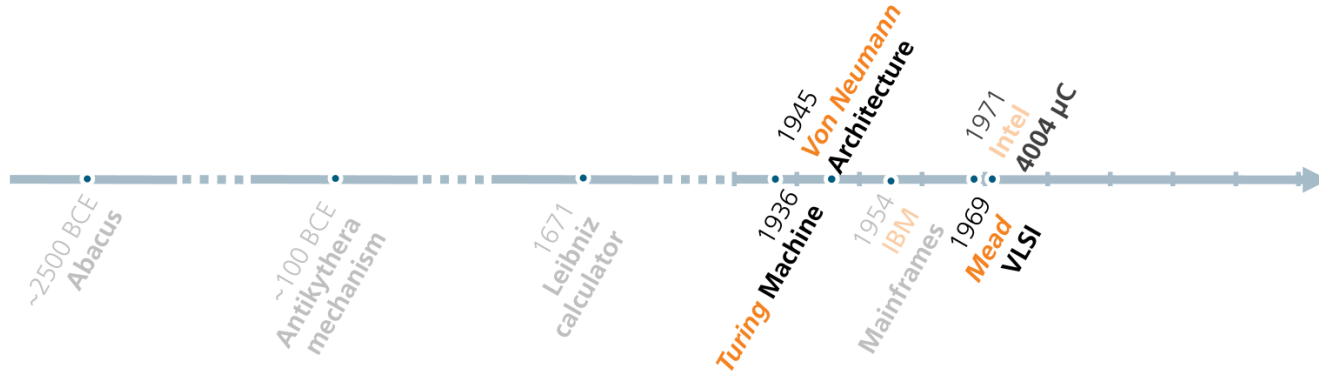
## The road of AI from "compute frugality" to "lavish opulence"



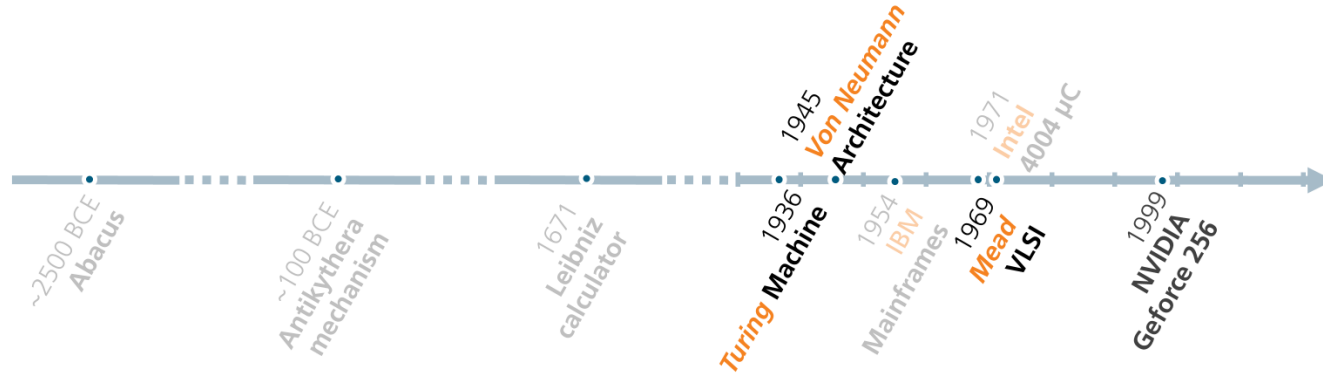
## The road of AI from "compute frugality" to "lavish opulence"



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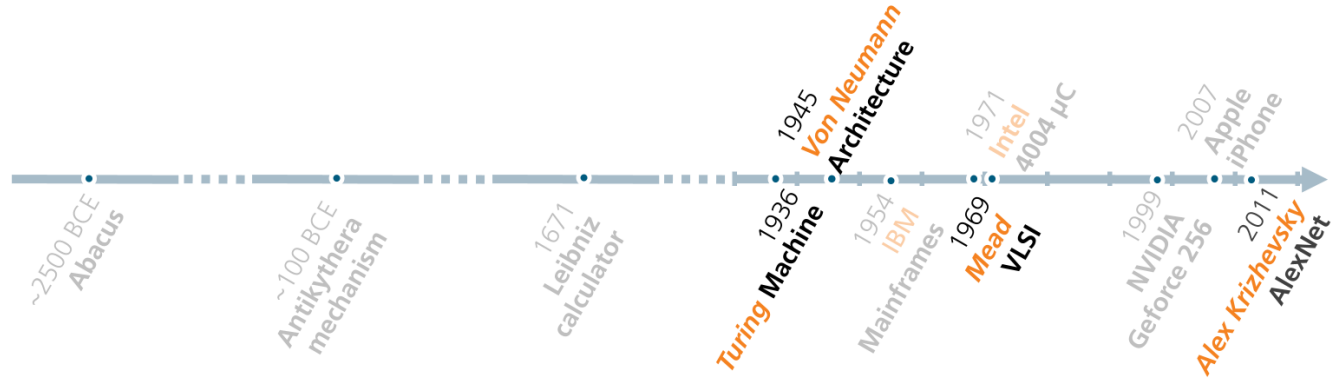
## The road of AI from "compute frugality" to "lavish opulence"



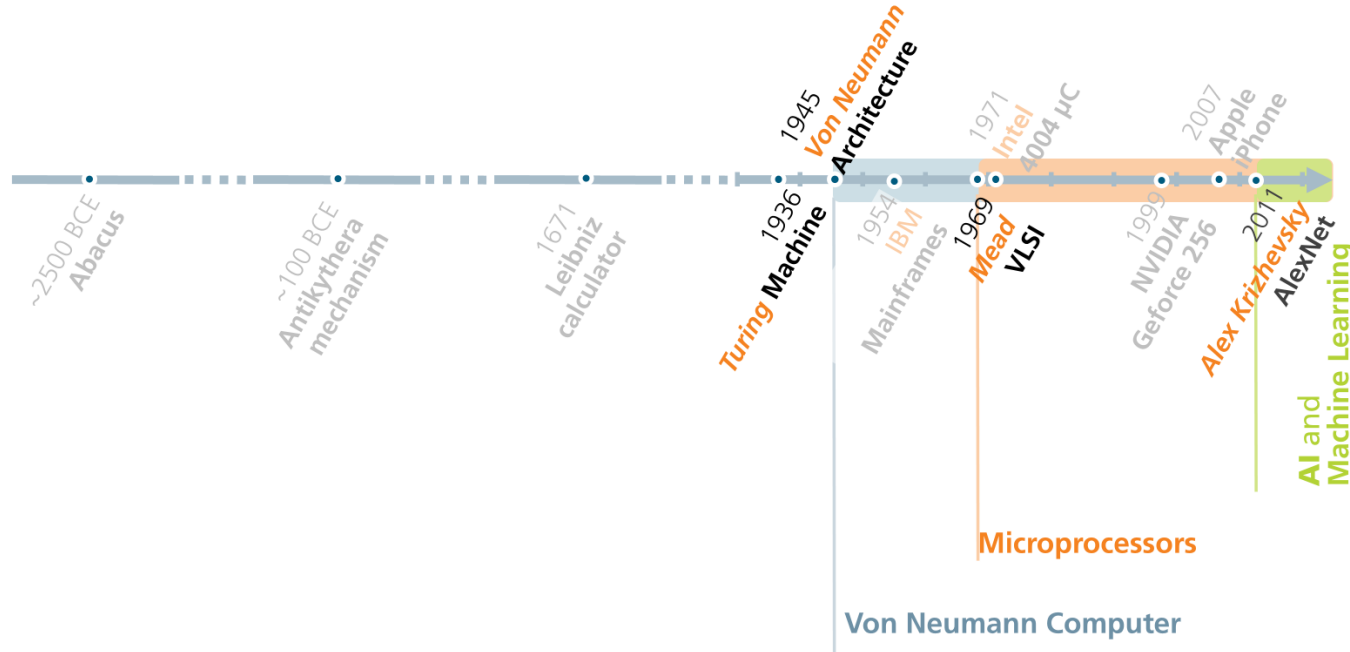
## The road of AI from "compute frugality" to "lavish opulence"



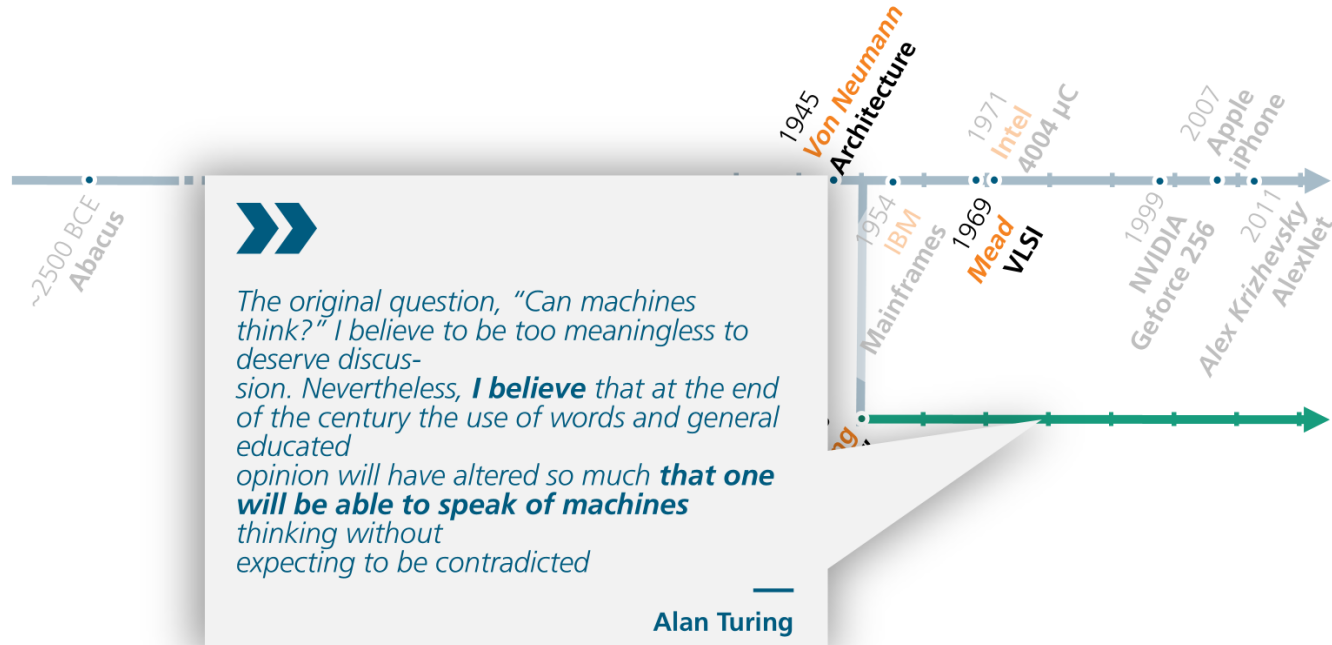
## The road of AI from "compute frugality" to "lavish opulence"



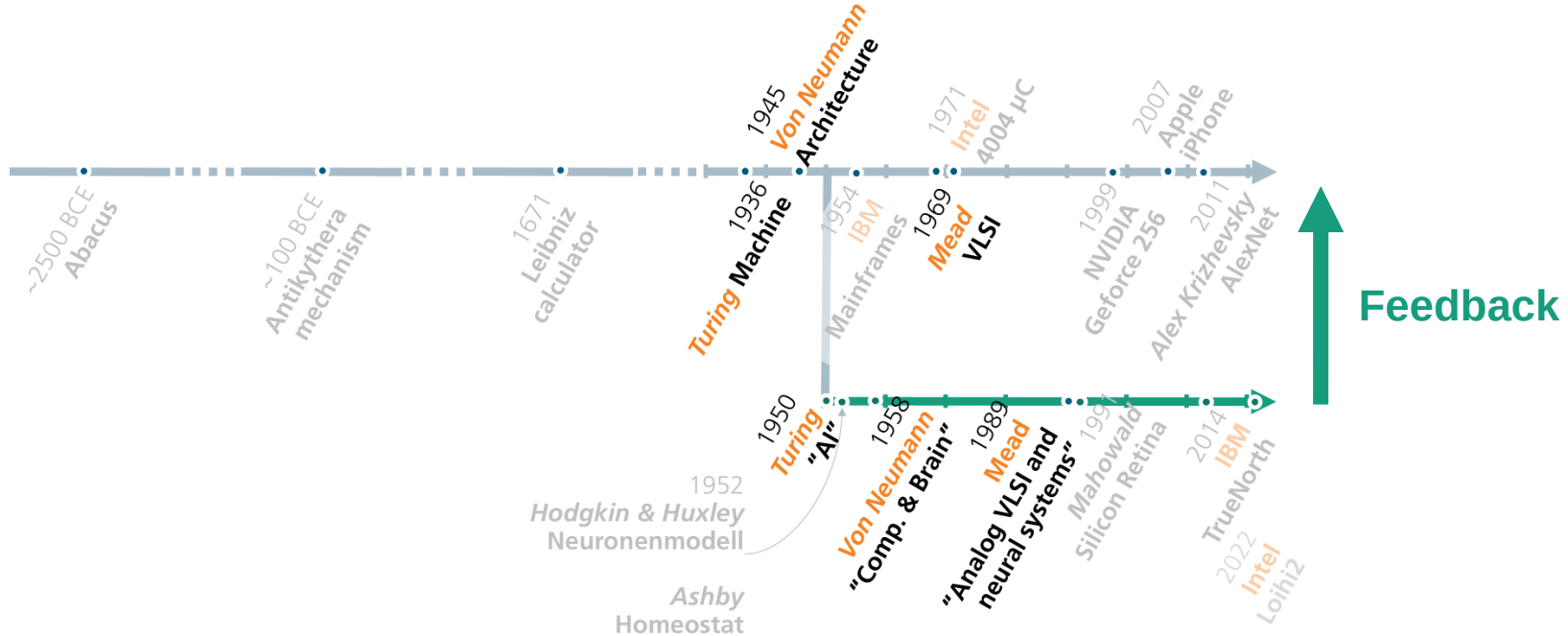
## The road of AI from "compute frugality" to "lavish opulence"



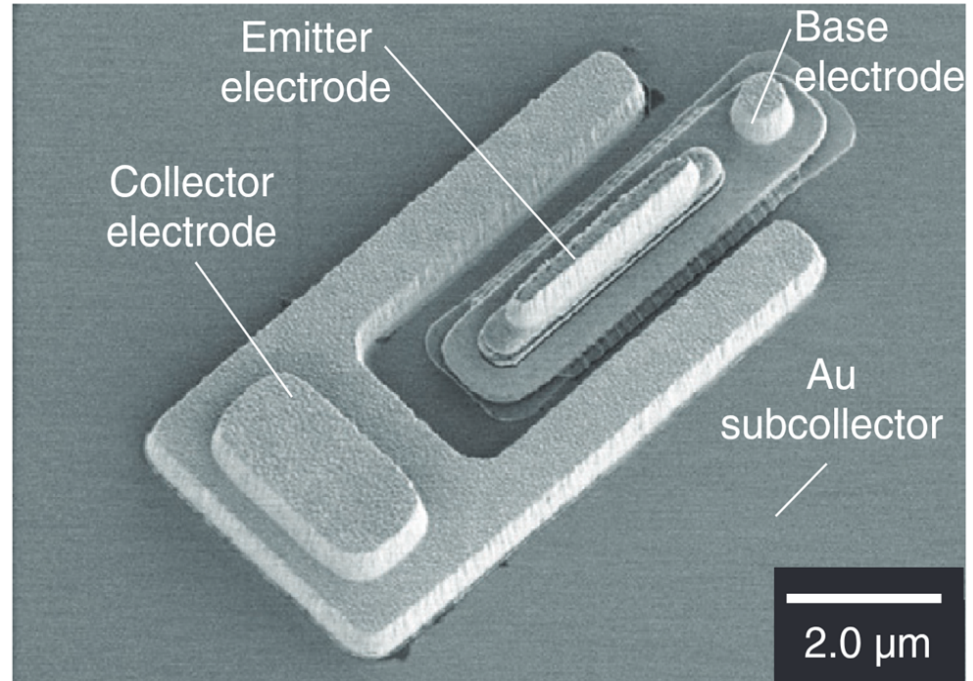
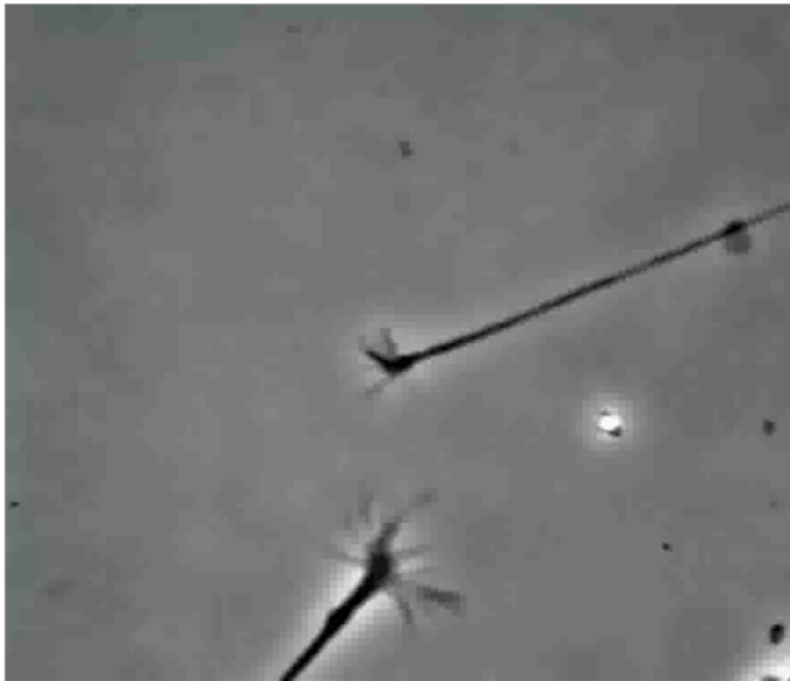
## The road of AI from "compute frugality" to "lavish opulence"



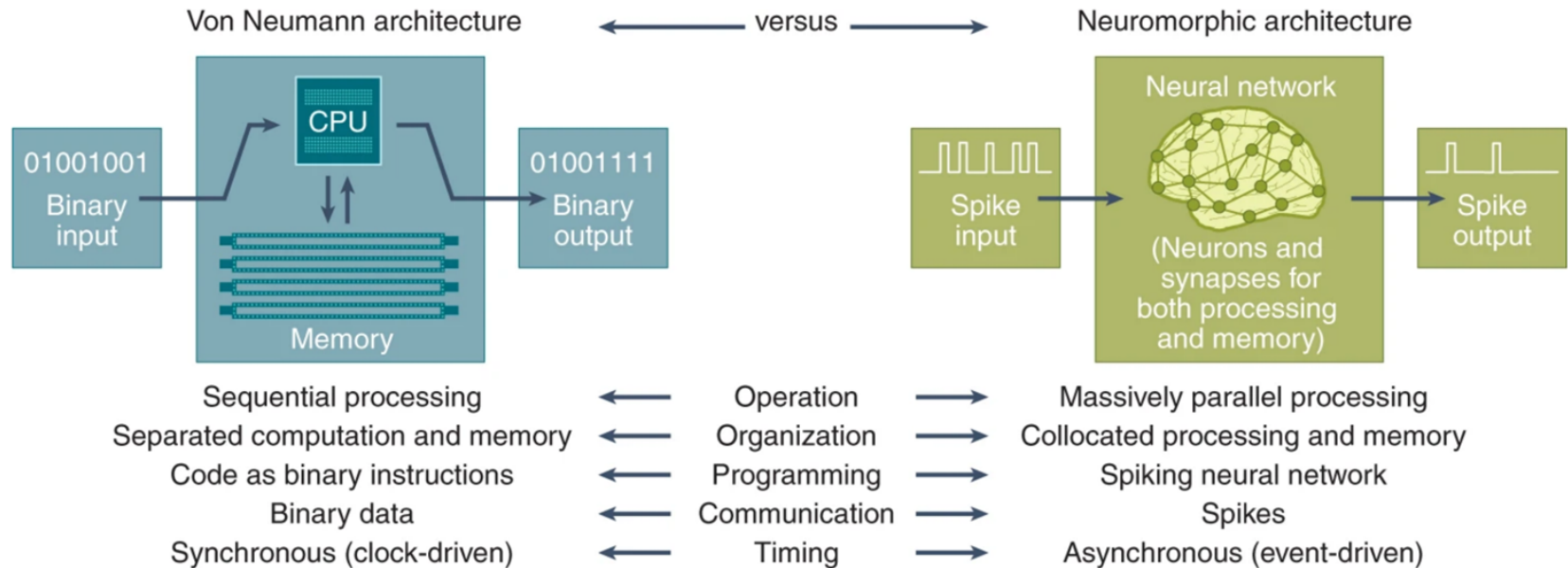
## The road of AI from "compute frugality" to "lavish opulence"



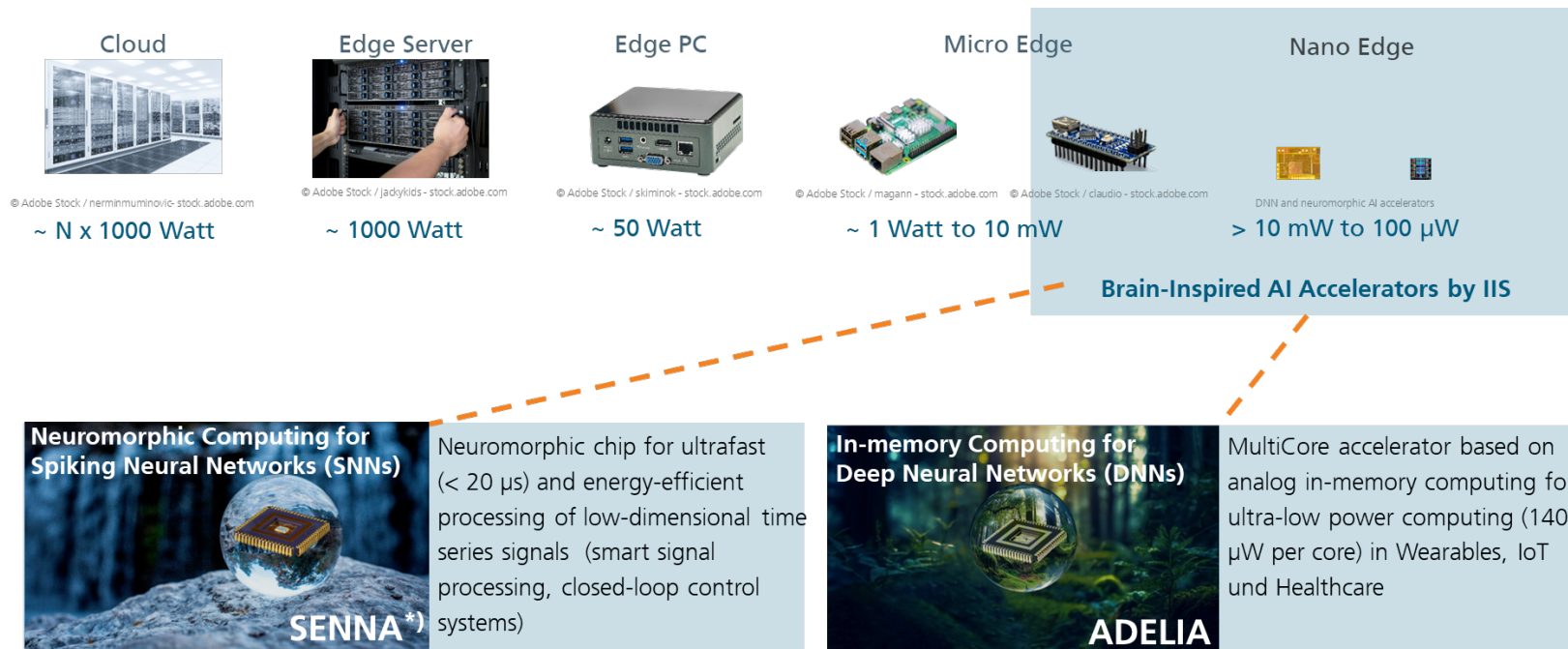
## From transistors and neurons...from hardware to wetware and...back



# How can we improve the environmental impacts of the AI technology stack?



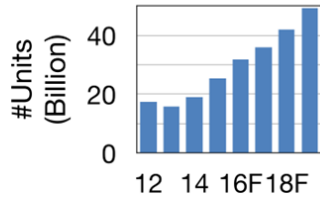
# How can we improve the environmental impacts of the AI technology stack?



<sup>\*)</sup> In Collaboration with Fraunhofer EMFT

## TinyAI: low-cost, low-power...ubiquitous

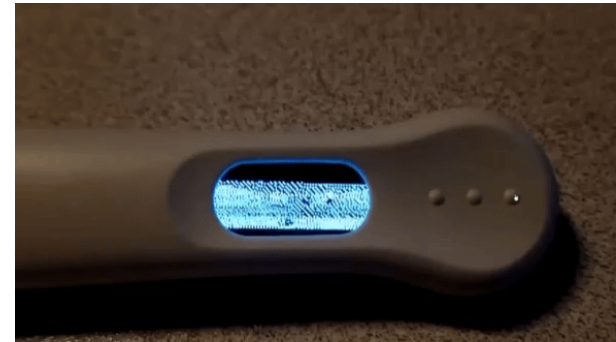
- Billions of IoT devices around the world based on **microcontrollers**
- **Low-cost**: low-income people can afford access. Democratize AI.
- **Low-power**: green AI, reduce carbon



Ubiquitous



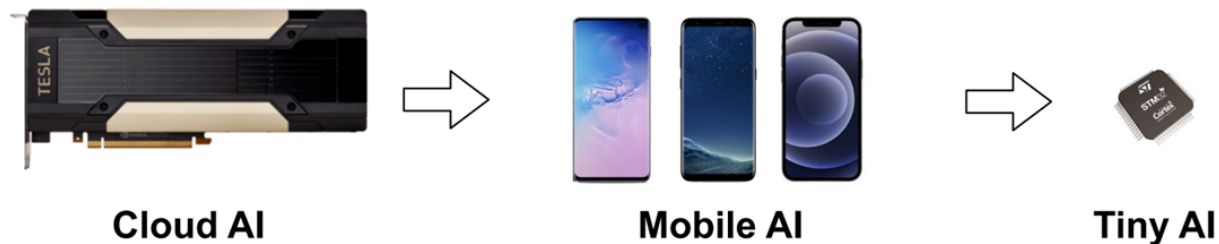
Low-cost  
(\$0.1 - \$10)



Low-power  
(mW)

[https://wiki.foone.org/w/Main\\_Page](https://wiki.foone.org/w/Main_Page)

## TinyAI: low-cost, low-power...ubiquitous

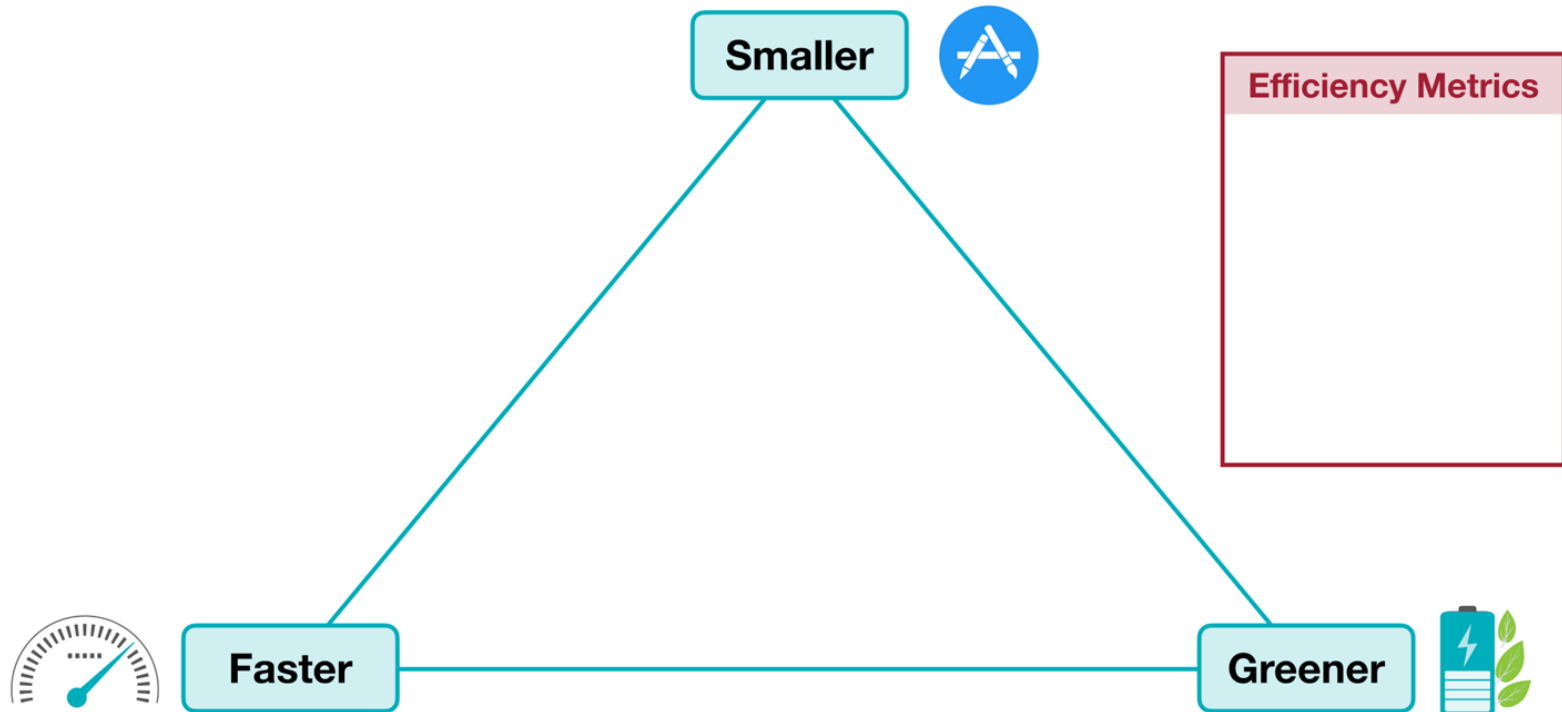


	Cloud AI	Mobile AI	Tiny AI
Memory (Activation)	32GB	4GB	320kB
Storage (Weights)	~TB/PB	256GB	1MB

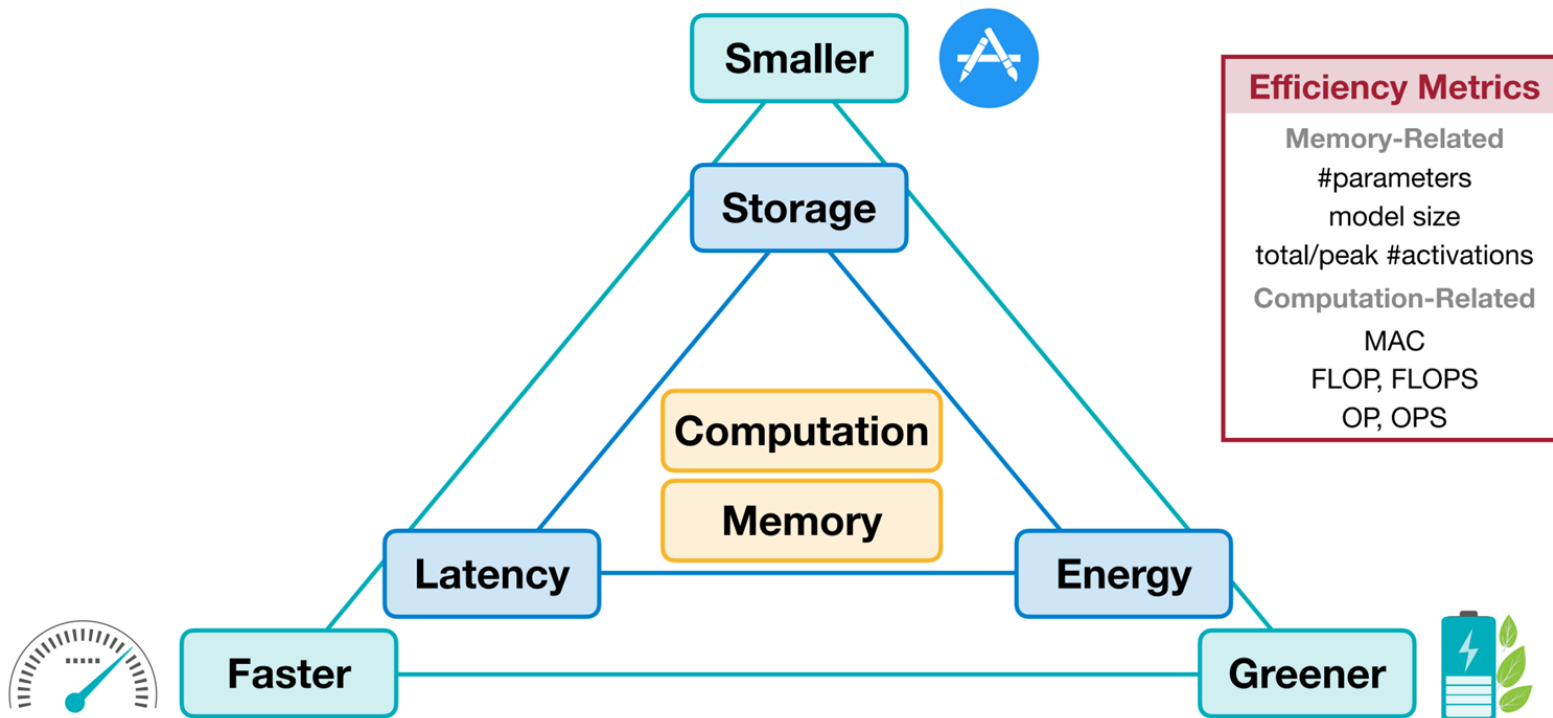
100,000x smaller (from Cloud AI to Tiny AI)

13,000x smaller (from Mobile AI to Tiny AI)

## TinyAI: low-cost, low-power...ubiquitous



## TinyAI: low-cost, low-power...ubiquitous



# The IDEA: Identify, Describe, Enable, and Adopt

*A perspective on judicious and lucrative application of AI*

