AI in medicine

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  - „A machine's ability to make decisions and perform tasks that simulate human intelligence and behavior.

Artificial Intelligence

The field of computer science that seeks to create intelligent machines that can replicate or exceed human intelligence

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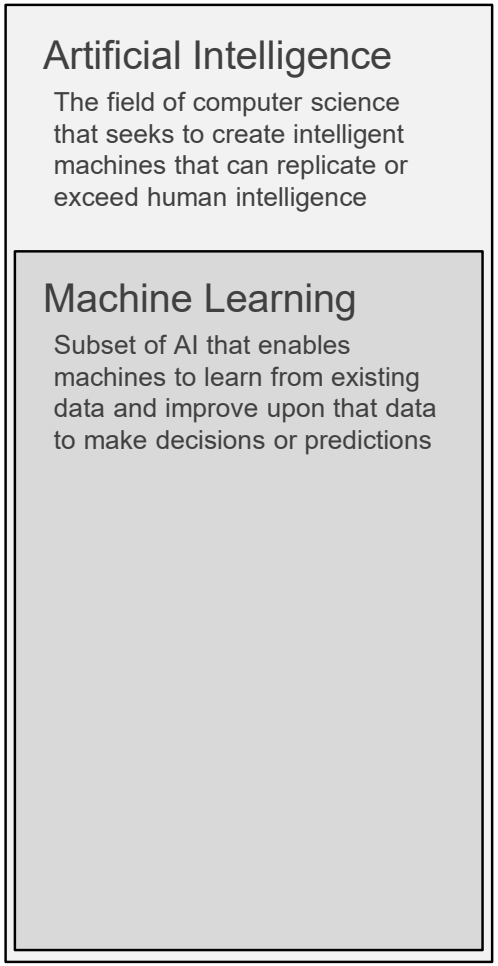

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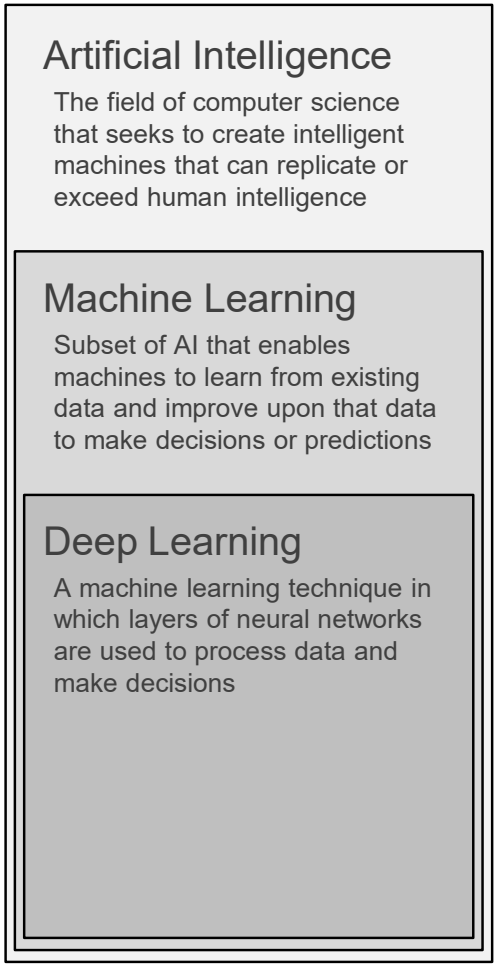

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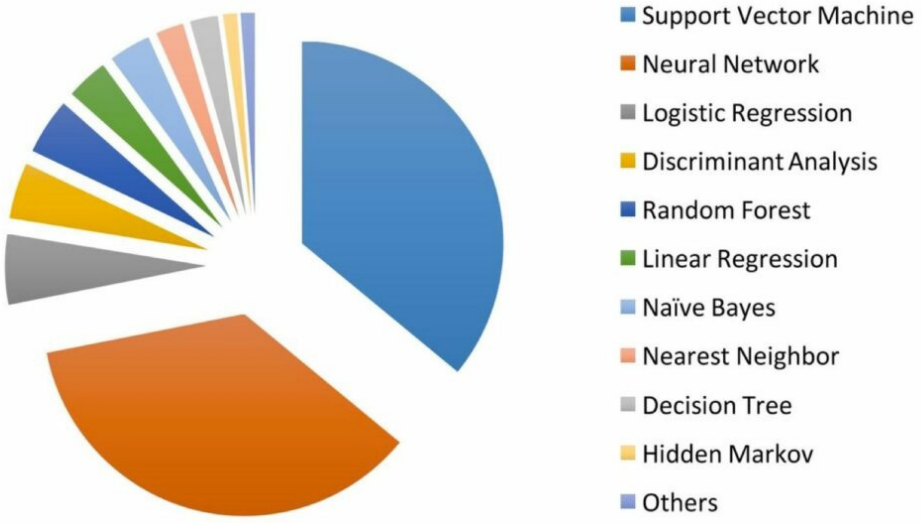
Artificial intelligence (AI) and machine learning (ML) technologies

- methods



Machine learning algorithms used in the medical literature
Artificial intelligence in healthcare: past, present and future, svn-2017-000101

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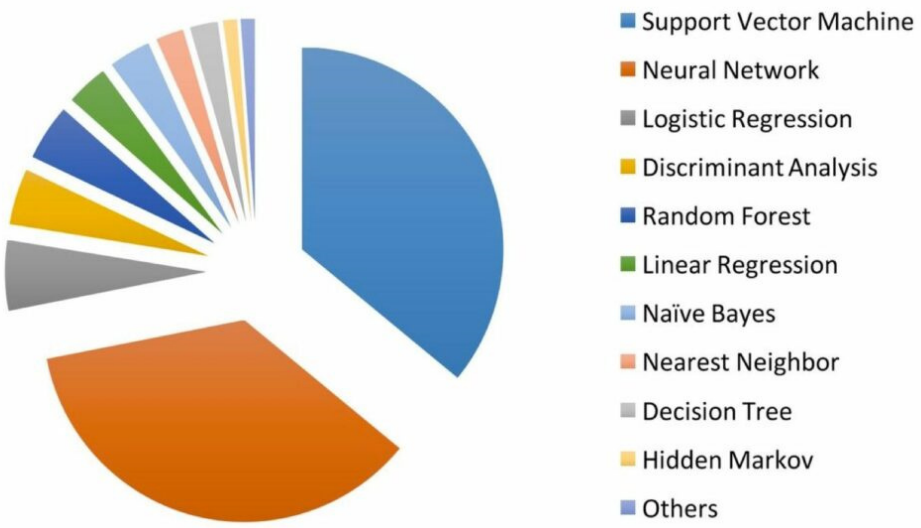

Machine learning algorithms used in the medical literature
Artificial intelligence in healthcare: past, present and future, svn-2017-000101

- disease detection
  - Bladder tumor
  - Alzheimer
  - Breast cancer
  - Tuberculosis
  - Cardiac arrest
  - Skin lesion
  - Artery occlusion
  - Diabetic retinopathy
  - Hypertension
  - Vertical root fracture
  - …

Artificial intelligence in disease diagnosis: a systematic literature review, …
J Ambient Intell Humaniz Comput. 2023; 14(7): 8459–8486
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8754556/

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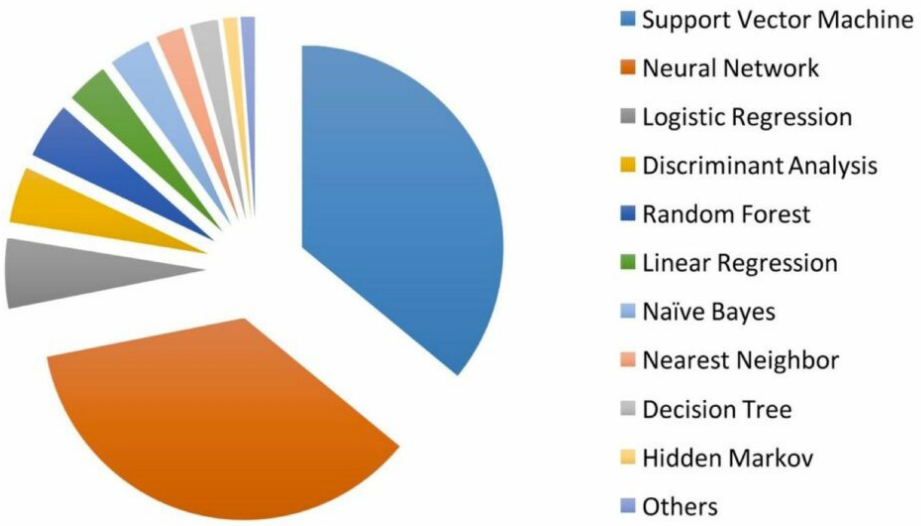

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- AI/ML-Enabled Medical Devices
  - Detection of bladder tumor
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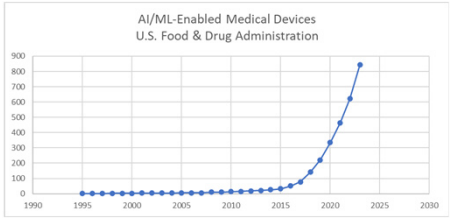
Artificial Intelligence and Machine Learning (AI/ML)-Enabled Medical Devices
U.S. Food & Drug Administration, 950 entries, 08/07/24
www.fda.gov/medical-devices/software-medical-device-samd/artificial-intelligence-and-machine-learning-aiml-enabled-medical-devices



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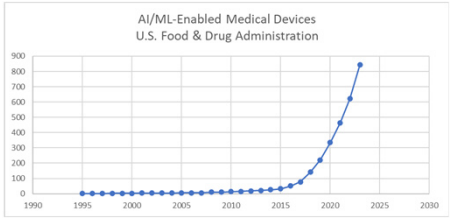

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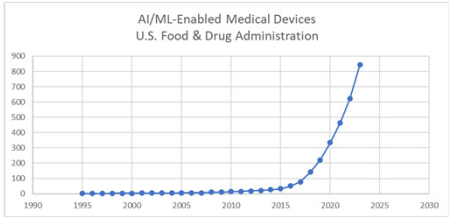

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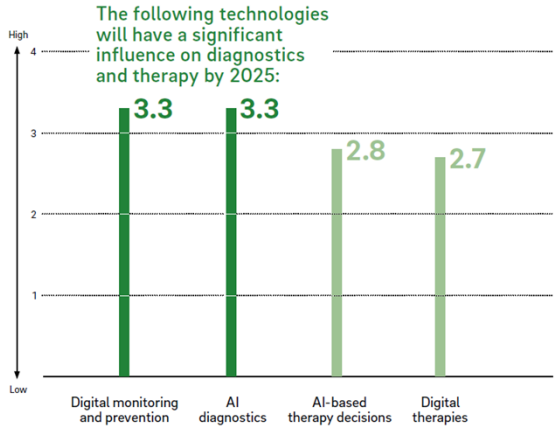

It's unlikely that AI will replace doctors outright. Instead, AI systems will be used to highlight potentially malignant lesions or dangerous cardiac patterns for the expert – allowing the doctor to focus on the interpretation of those signals.

https://content.rolandberger.com/hubfs/Roland-Berger_Future-of-health.pdf, 2019

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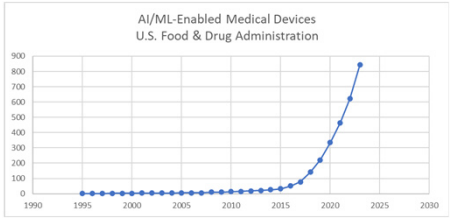

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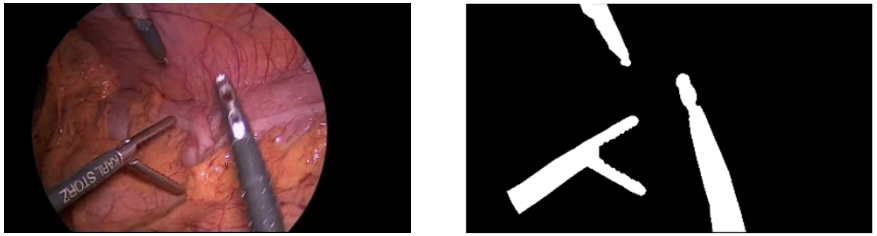
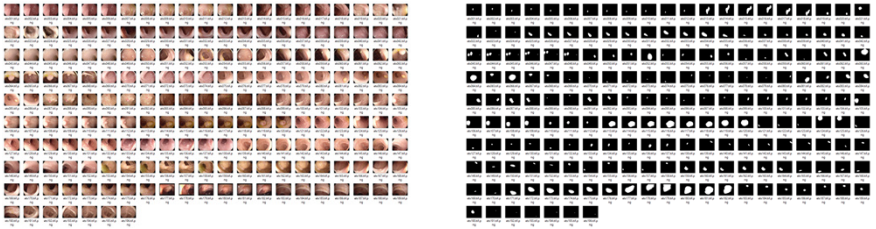
Data matter

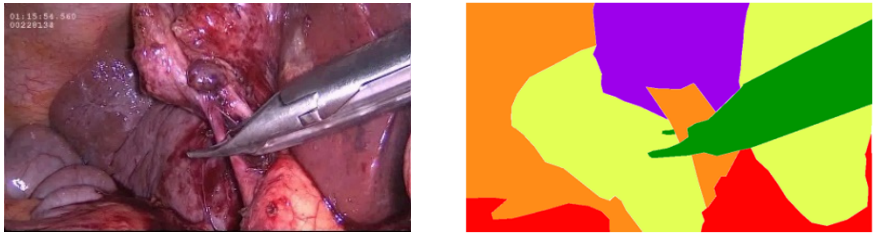
Annotated data



Robust Medical Instrument Segmentation (ROBUST-MIS)

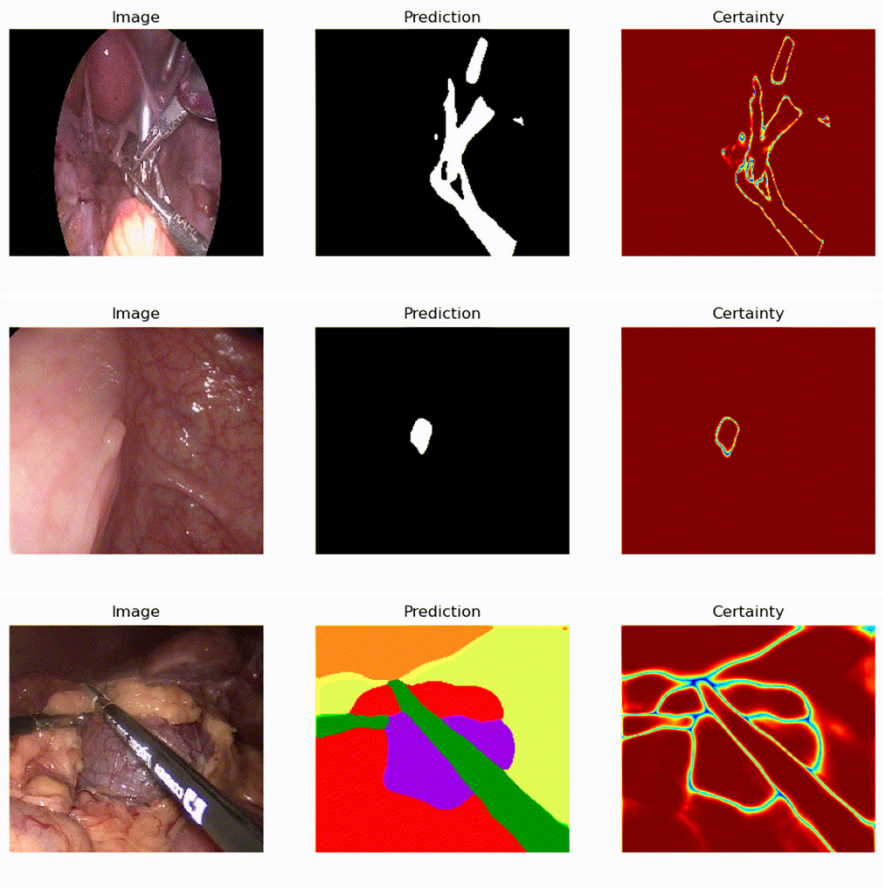


Gastrointestinal Image ANAlysis (GIANA)



HeiChole Surgical Workflow Analysis and Full Scene Segmentation (HeiSurF)

Image Prediction Certainty



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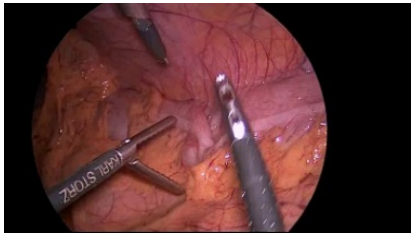

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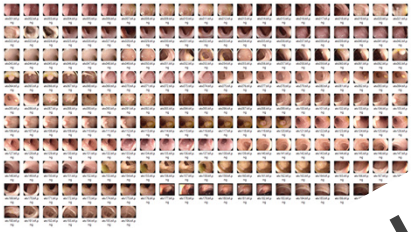
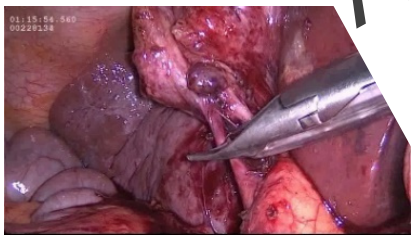


Gastrointe



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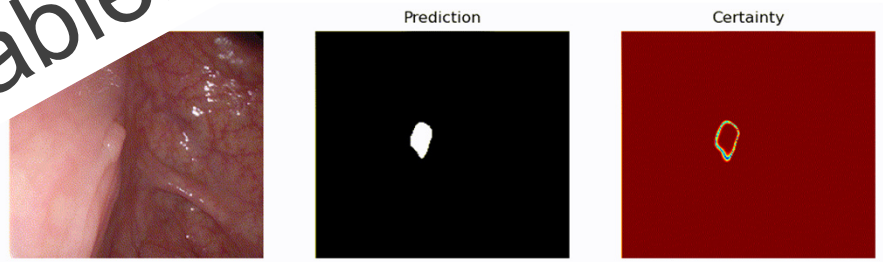

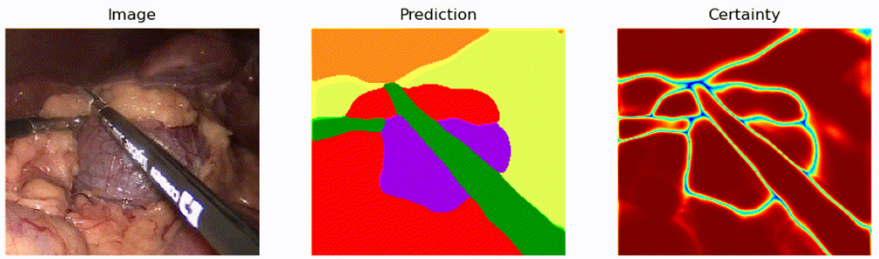

AI is an enabler for assistance
data is an enabler for AI

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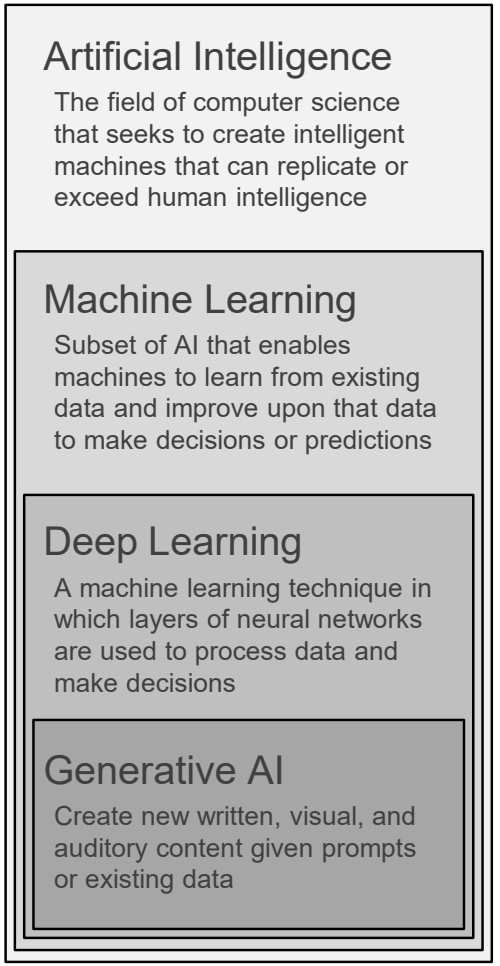

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AI in medicine – LLMs (Large Language Models)

	Olympus	Amazon	
	GPT-5	OpenAI	
	Grok-3	xAI	
	MAI-1	Microsoft	
2024	Grok-2	xAI	600B
2024	Llama 3.1	Meta AI	405B
2024	Claude 3.5	Anthropic	
2024	Nemotron-4	NVIDIA	340B
2024	Llama 3.1	Meta AI	70B
2024	Grok-1.5	xAI	314B
2024	Claude 3	Anthropic	2T
2024	Gemini 1.5	Google	
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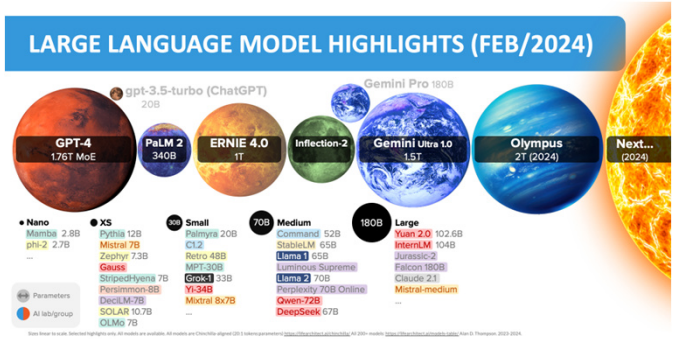

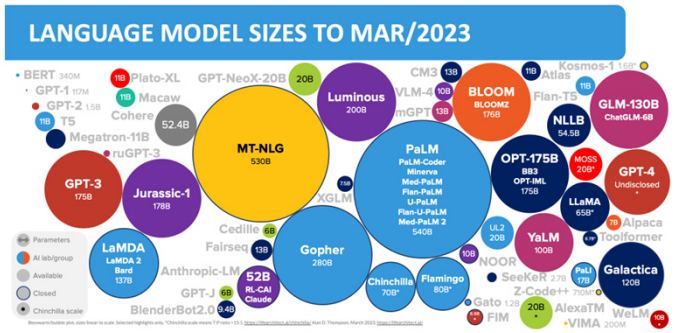

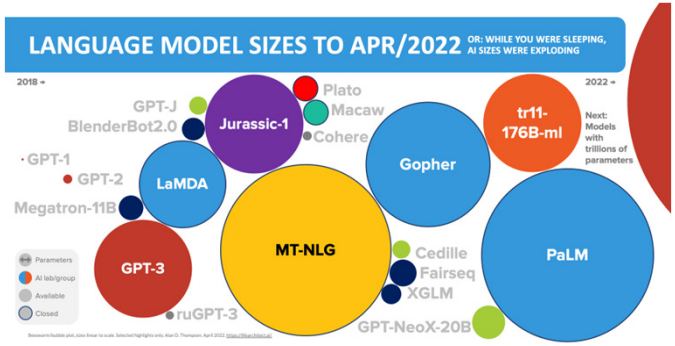

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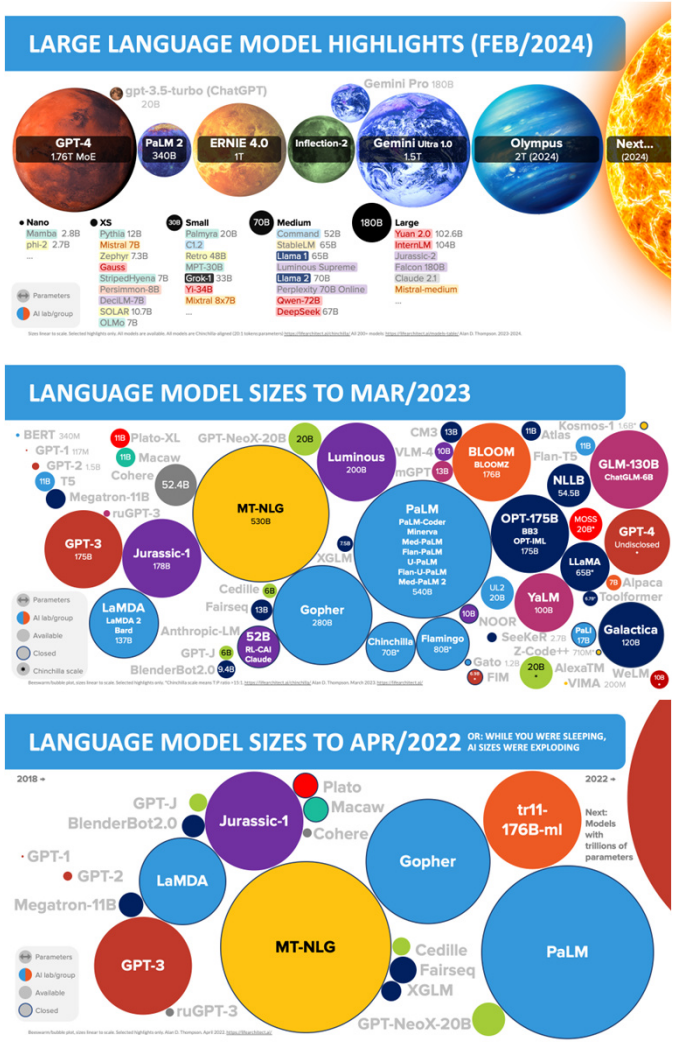

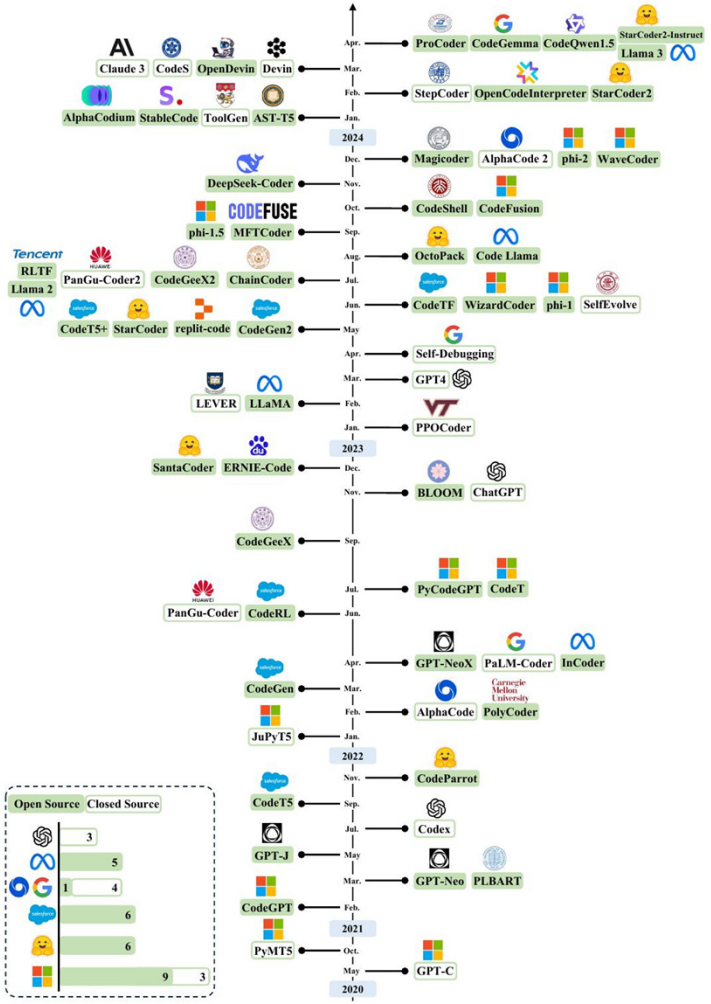

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