Why Are the Robots Smarter Than Us? A Brief History of Al

David Minor, April 2025







Technology history

General history

Present day

• Deep thoughts



Technology history



Technology history







Technology history





1956



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J. McCarthy, Dartmouth College M. L. Minsky, Harvard University N. Rochester, I.B.M. Corporation C.E. Shannon, Bell Telephone Laboratories

A PROPOSAL FOR THE

DARTMOUTH SUMMER RESEARCH PROJECT

ON ARTIFICIAL INTELLIGENCE



1956 Dartmouth Conference: The Founding Fathers of AI



Marvin Minsky



Claude Shannon



Ray Solomonoff





Herbert Simon



Arthur Samuel



Oliver Selfridge



Nathaniel Rochester



EURAL ETWORKS

VIDI

NATURAL LANGUAGE PROCESSING

HEORY OF COMPUTATION







Symbolic Al "Good Old-Fashioned Al" (GOFAI)

Assumed intelligence could be captured through formal rules and logical reasoning.

Expert systems began to be conceptualized which used rule-based systems to emulate human expert decisionmaking.



"Every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it."

John McCarthy



ARABIAN NIGHTS PALACE CANASTA PAJAMAS 20 CENTS

EG. U. S. PAT. OFF

DECEMBER 21, 1953





Carnegie Institute of Technology (Now CMU)





Stanford









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- Unrealistic Expectations vs. Reality
- Lack of Computational Power and Memory Constraints
- Inefficiency of Early Algorithms
- Fragile Al systems
- Rudimentary Machine learning lacked large datasets for training

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INSIDE A MODERN ARABIAN NIGHTS PALACE

20 CENTS

"Most workers in Al research and in related fields confess to a pronounced feeling of disappointment in what has been achieved in the past twenty-five years... In no Berlof gleffentive Geoort discoveries made so far produced the major impact that was then promised."

- James Lighthill

"The Lighthill Report"

Science Research Council

Artificial Intelligence











FORMERLY TITLED SYMBOLIC LOGIC FROM THE ADVENTURES OF DARTMOUTH



A NEW HOPE

1980s saw a surge in Al programs designed to mimic human decisionmaking in specialized fields.

Businesses invested heavily in expert systems, believing they would revolutionize industries.



FORMERLY TITLED SYMBOLIC LOGIC







SCORE: 18







EXPERT SUSTENSE A NEW HOPE



SYMBOLIC LOGIC

FROM THE ADVENTURES OF DARTMOUTH



ATTACK OF THE CLONE.

Many expert systems were expensive to maintain and failed to scale, leading businesses to lose confidence.

The U.S. government and private sector cut Al funding, contributing to an Al Winter that lasted into the 1990s.

FORMERLY TITLED SYMBOLIC LOGIC FHARIT LOSECT OH TUNITOLD ROHCO





1987-1993: Second Al Winter

1990200020102020



"The current era"

Natural Language Processing

Pattern Classification

Image Recognition



Machine Learning

Token Prediction / Generative AI



Machine Learning

Supervised Learning

All the data in the world. (Literally)

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Deep Learning Unsupervised Learning

GPTs / LLMs

Reinforcement Training

All the computation in the world.

(Literally)







2000s: GPUs

1990s: Data Explosion

1987-1993: Second Al Winter

1990200020102020







How does the history of AI map to the history of the societies around it?





The History of Almocracy

Decolonization, new democracies in Africa, Asia

Post-WWII democratization (Germany, Japan)

Democratic backsliding (Cold War dictatorships)

1980

1974-1980: **First AI Winter**

1970

1950

1960

2000s: **GPUs**

1980s: **Transitions**

Post-Cold War democracy surge (Eastern Europe)

Democratization wave in Latin America, Asia)

Democratic Exr plateau, some setbacks (Russia, China)

Democratic backsliding (Rise of authoritarianism)

1987-1993: **Second AI Winter**

1990 2000 2010 2020





 Al and democracy were largely in sync until the 1990s-2000s.

 Today, Al is increasingly being used by authoritarian regimes to suppress freedoms, posing new challenges for democracy.

 The future depends on how Al is regulated—will it empower individuals or reinforce control?

WORLD DEMOCRACY


Enough history, what's happening NOW?

Social media as training data

___ 0 LI. NICHOLAS A. CHRISTAKIS, MD, PhD AND JAMES H. FOWLER, PhD



ENDS FEEL, THINK, AND DO NICHOLAS A. CHRISTAKIS, MD, PhD READERS' PIE AND JAMES H. FOWLER, PhD 15104

How your friends' friends' friends affect everything you feel, think and do.

"Your friends make you fat."

ANNALS OF PSYCHOLOGY

HAS SOCIAL MEDIA FUELLED A TEEN-SUICIDE CRISIS?

Mental-health struggles have risen sharply among young Americans, and parents and lawmakers alike are scrutinizing life online for answers.

> By Andrew Solomon September 30, 2024





Don't eat Tide Pods: 'Tide Pod Challenge' is simply peer pressure

January 18, 2018 | By Roxanne Cooke

The New York Eimes

The storming of Capitol Hill was organized on social media.





News Sport Business Innovation Culture Arts Travel Earth Audio Video Live Home

India 'WhatsApp child abduction rumours': Five more lynched

ENGLISH

1 July 2018

AMNESTY INTERNATIONAL

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MYANMAR: FACEBOOK'S SYSTEMS PROMOTED VIOLENCE AGAINST ROHINGYA; META OWES REPARATIONS



Fyou've been sexually harassed or assaulted write 'me too' as a reply to this tweet.	Relying to @Alyssa_Magno Main	
Me too. Suggested by a friend: "If all the women who have been sexually harassed or assaulted wrote 'Me too.' as a status, we might give people a sense of the magnitude of the problem." Emmy Rossum @ @emmyrosse Replying to @Alyssa_Milano	We Too #TogetherWeRise	Follow Marcia Replyin Me too \$
Me too Me too Gabrielle Union Control College Gabrielleu You know us. We are your family members. Your friends. Your co-workers. Your neighbors. And yes, even your heroes. We are everywhere. #Metoo	Reese Witherspoon BRWitherspoon #MeToo	terrycrew @terrycrews This whole giving me i thing happ
Replying to @Alyssa_Milano Me too 76 to 101 U S V43	Alyssa Milano © @Alyssa_Milano by a friend: "If all the v exually harassed or at to:" as a status, we mix the of the magnitude i mckayla ©	or assaulted write Ann Beplying to @4 Me too



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na Paquin 🥥 naPaquin Alyssa, Milano



We are forever grateful for the generous outpouring of support we received from the ALS Ice Bucket Challenge.

The ALS Association is leading the fight to find treatments and a cure for ALS – through robust research, care services, and public policy programs.

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Numbers represent <u>committed</u> and anticipated spending





Current adoption

No technology in human history has spread so quickly.



ChatGPT reached 100 million users within two months of launch, making it the fastestadopted technology in history.











The global value of Al in medical diagnostics market:

~\$505 million in 2020 ~ \$3.87 billion in 2025

A compound annual growth rate of ~50.2%

https://finance.yahoo.com/news/global-ai-medical-diagnostics-market-091800048.html





https://www.qualitymag.com/articles/98588-ai-in-manufacturing-reshaping-quality-control-and-efficiency

The percentage of manufacturing companies using Al for quality control:

~35% in 2023

~63% in 2024



A radical reformulation of computing



Data





Algorithm



Bodblam





All the Data in the world





Algorithm



Problem





All the Data in the world



Bodbiem



Algorithm





See you soon! 1'|| ľm Q W ľd E R Y U A S 0 D F G H J K Ζ X L С V B N M 123

TOP PICKS FOR YOU



BIRDBDX



Continue Watching



Health & Fitness

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SERVICE **CHATBOTS**



Q search engine summaries

A search results

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VIRTUAL ASSISTANTS

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They don't "look" like Al in the flashy, sci-fi sense. They:

Blend into existing services.

Are seen as conveniences, not hightech marvels.

Often marketed as "smart features" rather than "Al."



All the Data in the world







Solution

Algorithm







This is a fundamental change.

This is a fundamental change.

Previously, the person who created the algorithm was responsible for the solution.

Now, the person who creates the AI goal is responsible for the resultant algorithm.



In programming we're used to teaching people to write code, be efficient, look for mistakes, etc. which means we have criteria by which to evaluate its usefulness, effectiveness, originality, etc.

In the new world, it's not clear what role these things have. We don't always know what the AI is always doing, and if it gives us the answer we want.

It also makes it easier for the algorithm to just keep on running.





ourse Alspits out) 😲 hateful, racist, smisogynistic bile-it's trained on the worse of humanity."





Generic Evil Person



Generic Evil Person





Strengths

Humans+Al models

BMW

Human-AI collaboration in manufacturing

Fewer mistakes, faster production

Safer, more efficient work for human operators



Amazon AI-Enhanced Warehouse Logistics

Faster order fulfillment Fewer picking/packing errors Reduced worker fatigue Lower operational costs



Mayo Clinic Al for Patient Diagnosis and Support

Faster and more accurate diagnoses

More personalized treatment plans

Proactive care and quicker emergency response

Improved patient satisfaction and staff efficiency

Sometimes Al alone is better

Standardized tests **United States**

SAT - undergraduate admissions

GRE - graduate admissions

Bar exam - lawyer

USMLE - doctor

SAT Scores (college admission)

Math
100 100 Human 75 50 75 25 0 50 25 0

SAT Scores

GRE Scores (grad admission) GPT 3.5 GPT 4.0

Writing

Quant. Reasoning



Bar Exam



USMLE

Bar Exam



SAT Scores



Bar Exam

Home > Blog >

AMIE: A research Al system for diagnostic medical reasoning and conversations

January 12, 2024 ·

Posted by Alan Karthikesalingam and Vivek Natarajan, Research Leads, Google Research

https://research.google/blog/amie-a-research-ai-system-for-diagnostic-medical-reasoning-and-conversations/







"AMIE outperformed primary care physicians on multiple evaluation axes for diagnostic dialogue in our evaluations."



Top-n



Top-n



Top-n







Deep thoughts





Society's Trust in Technology vs. Al Development Over Time ____ 2000 2010 1990 2020 Year









If trust in technology has eroded while democracy suffers, why is AI so popular?



Al can often replace the entire programming stack.

Which means almost anyone can plug it in to their work.

The Al isn't going to ask any questions.

It's just going to make them happy.





It also explains why people hate technology but love AI -

it just does whatever they tell it.

ourse Alspits out) 😲 hateful, racist, smisogynistic bile-it's trained on the worse of humanity."



.... 10 **ONTHE** NS MAKE PEOPLEMENT THANK YOU





Top-3 Diagnostic Accuracy

Management Plan

Escalation Recommendation

Specialist Physician Perspective



Perspective



s with increase in AI consultation or usage				
Directly Used First Al Suggestion	Directly Used Al Suggestions After - Multiple Reloads	Used Al Suggestions For - Guiding Responses	Always Consulted Al But - Not Always Used	Always Consulted And Always Used Al

Automatic/AI-based Evaluation: Expressed empathy score







AUTHORITY BIAS Human tendency to be Filenced by the inions and judgments of authority figures.







Finally, something is puncturing conspiracy theories

Researchers found an AI bot is pretty good at helping people rethink false beliefs.

February 26, 2025

ត 6 min



https://wapo.st/448uozM

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(Washington Post illustration; iStock, Getty)

"When you're interacting with AI, you're not arguing with a human being whom you might be standing in opposition to, which could cause you to be less open-minded."

So, of course the logical questions are ...









The New York Eimes

THE SHIFT

Can A.I. Be Blamed for a Teen's Suicide?

The mother of a 14-year-old Florida boy says he became obsessed with a chatbot on Character.AI before his death.





Why are the robots smarter?

What did history show us?

Building purely from logical suppositions didn't take us far enough.

When computation became able to process "the world" as its inputs everything changed.



INSIDE A MODERN

IAFE

DECEMBER 21, 1953



••• and

This came at a time when mistrust in governments grew and beliefs in democracy decreased.

Social media and mass communications became part of life.

WORLD DEMOCRACY




What do we see today?

We now have tools that anyone can use to do whatever they want, without specific knowledge.

And the Als are better than humans at pretending to care, even though they don't.



hello wo





Als have learned how to convince people to do pretty much anything.

But it's not real!

Als are content agnostic and merely focused on their goal.





Why are the robots smarter?

Their criving function is to make people happy.



Your job as the future of our societies is to navigate what it means to be human in a world where Als appear better humans than reality.



Don't let the robots dream us away.



This is YOUR WORLD.

What do you want to do with it?







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