Artificial Intelligence History

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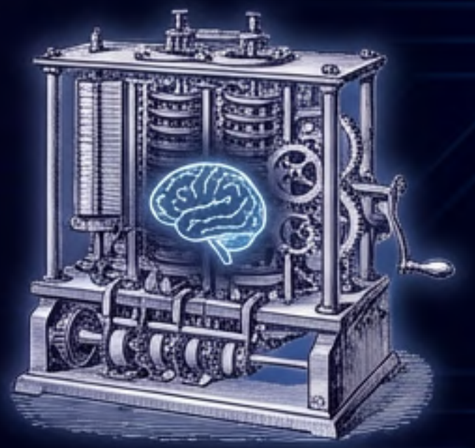
LONG BEFORE COMPUTERS...

"WHAT DOES IT MEAN TO THINK?"

ANCIENT PHILOSOPHY

MATH & LOGIC

EARLY MACHINES



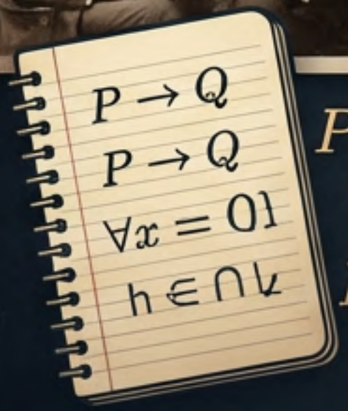
ANCIENT PHILOSOPHY MATH & LOGIC EARLY MACHINES

AI

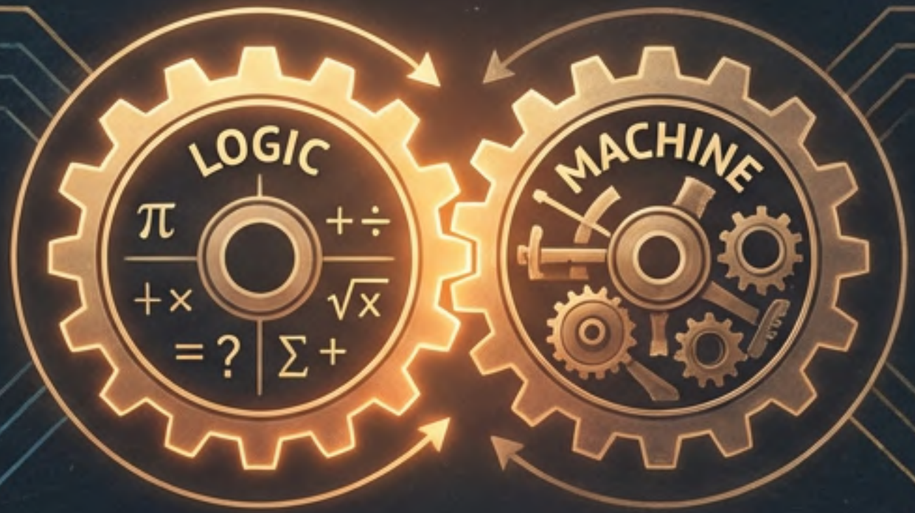
From Philosophy to Math & Machines: The Quest to Copy Thought.

THE CONVERGENCE: LOGIC MEETS MACHINE

The pieces fall into place.



$P \to Q$
$\forall x \leftarrow \mathbb{R}$
$P \to \forall x)$



SYMBOLIC LOGIC
(Early 1900s)

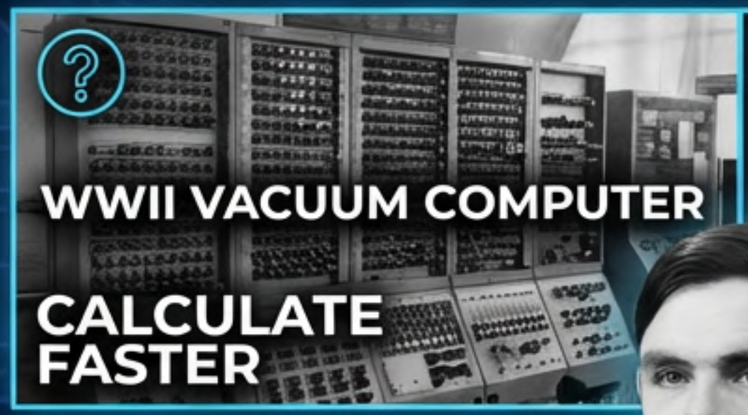
PRECISE MACHINES
(Instruction-Based)

THE CONVERGENCE: LOGIC MEETS MACHINE

The pieces fall into place.

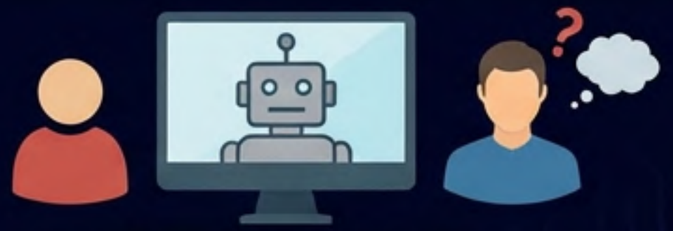
THE FIRST SPARK: AI ORIGINS (1940s-1950s)

“WHAT IF A MACHINE COULD THINK?”

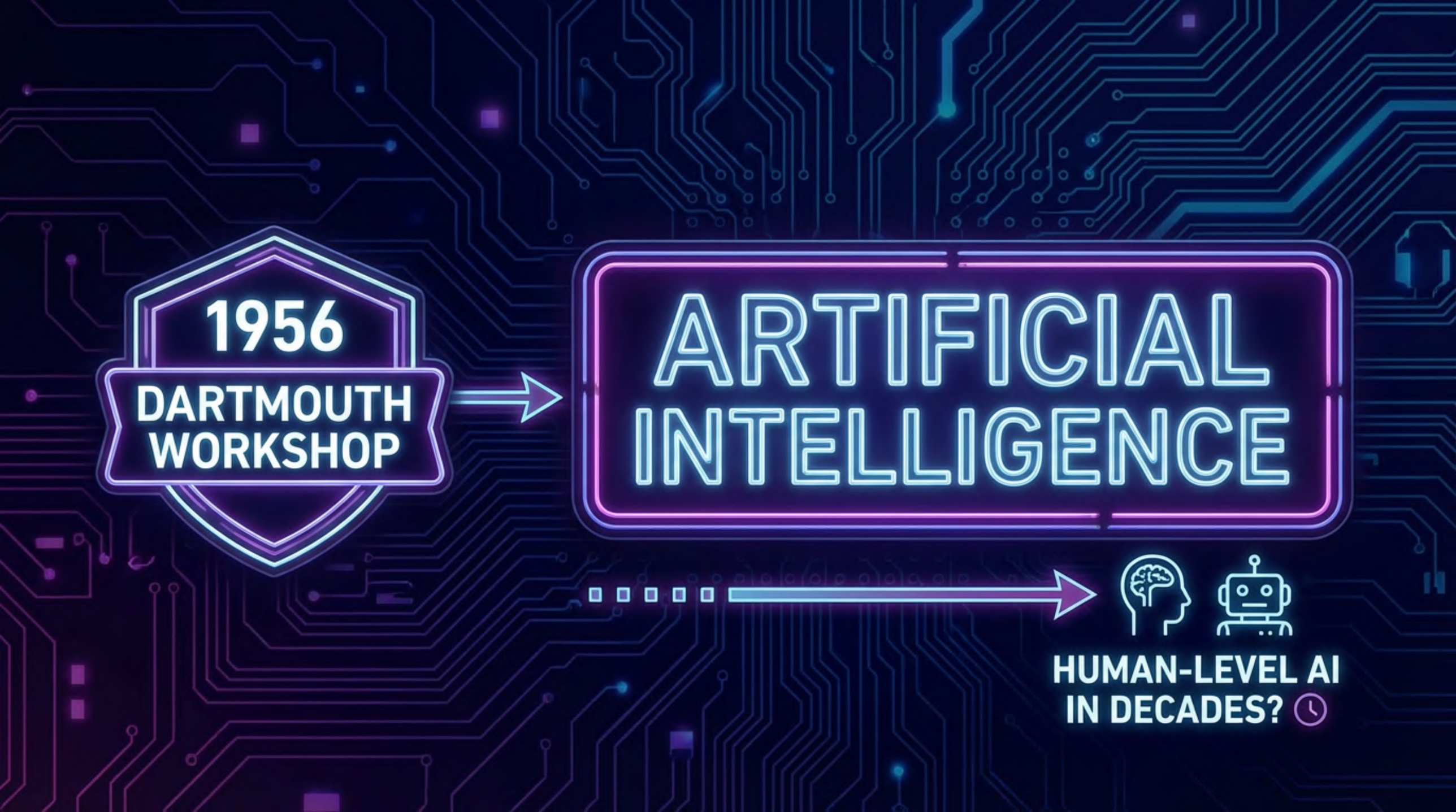


1950: ALAN TURING ASKS:

“CAN MACHINES THINK?”

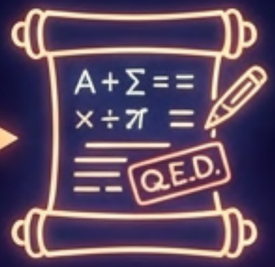


THE TURING TEST:
CONVINCING CONVERSATION?


1956
DARTMOUTH WORKSHOP
ARTIFICIAL INTELLIGENCE
HUMAN-LEVEL AI IN DECADES?

EARLY AI EXCITEMENT (1950s–1960s): "WE'RE CLOSE!"

CHECKERS
(Learned)



MATH
THEOREMS
(Proved)

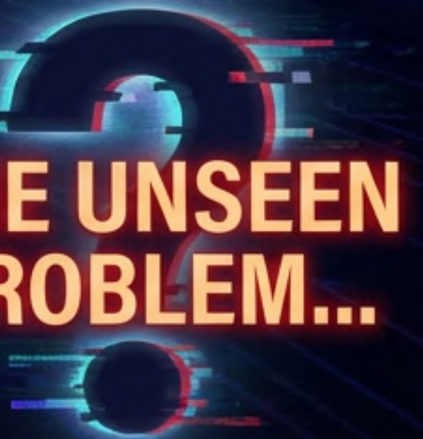
PUZZLES &
PLANNING
(Solved)

Intelligence
= Logic

Logic =
Programmed

Intelligence
= Programmed

MATCH HUMANS
IN 20 YEARS

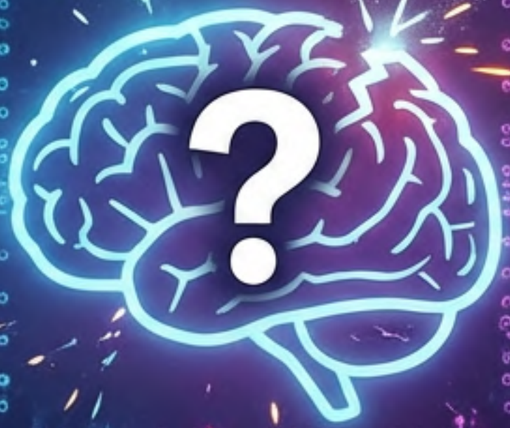


THE UNSEEN
PROBLEM...

REALITY HITS (LATE 1960s): “WHY IS THIS SO HARD?”

MICROWORLD

REAL WORLD



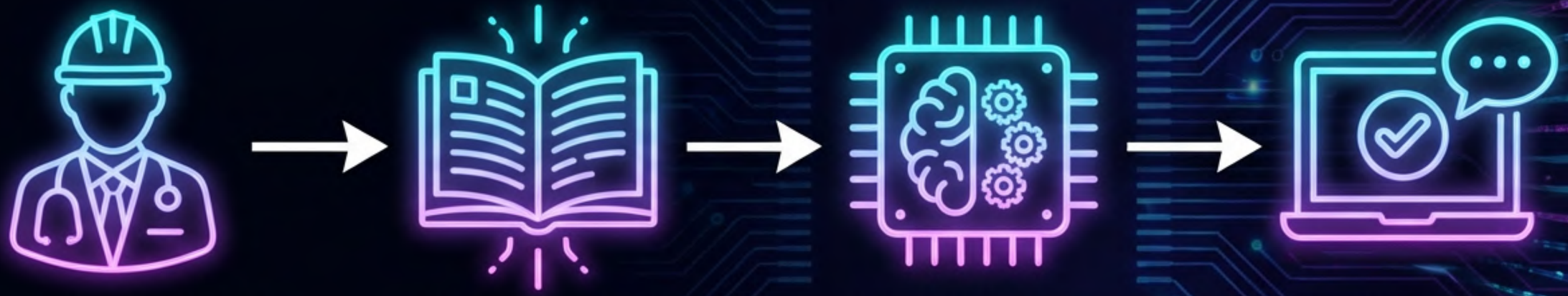
BIGGER PROBLEMS & MESSY SITUATIONS

REAL WORLD ≠ NEAT RULES

POOR VISION & NO COMMON SENSE

FUNDING PATIENCE LOST. PROGRESS SLOWED.

EXPERT SYSTEMS: THE KNOWLEDGE-BASED APPROACH



HUMAN EXPERTS
(Doctors, Engineers, Scientists)

KNOWLEDGE RULES
(Written Down)

EXPERT SYSTEM
(Follows Rules)

COMPUTER ADVICE / SOLUTION

LESSON: Filling machines with human expertise, not learning from scratch.

THE AI WINTER: FROM PROMISE TO FREEZE

EARLY SUCCESS & LIMITS

EXPECTATIONS COLLAPSED

AI's Paradigm Shift: Embracing Uncertainty

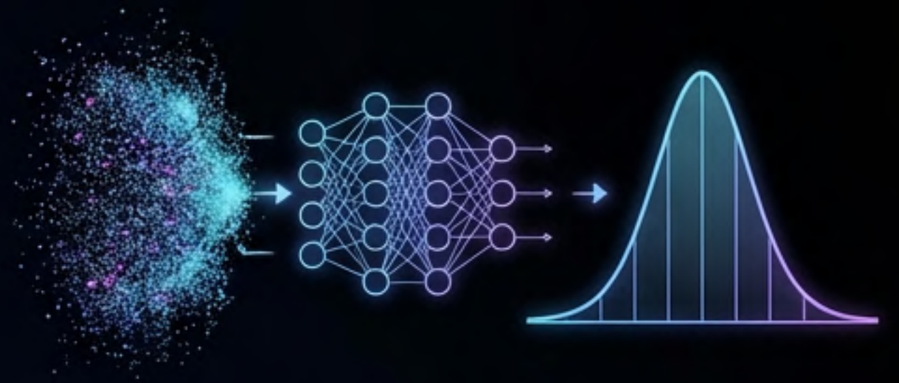
"The world is messy, noisy, and uncertain — and intelligence survives anyway."

FROM HARD RULES TO:

- Machines estimated likelihoods
- Learned patterns from examples
- Improved through experience

A NEW APPROACH:

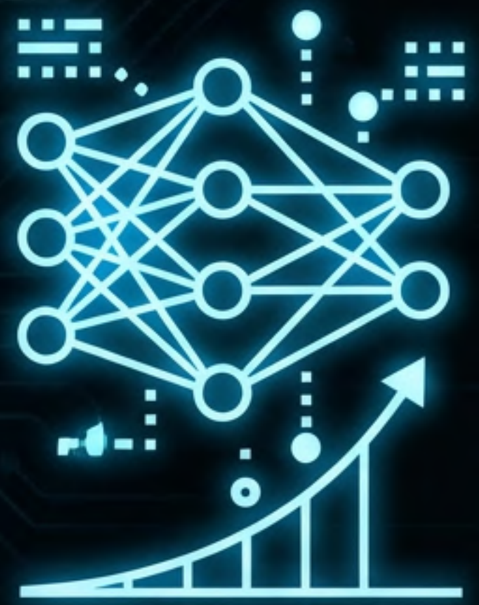
- Probability
- Statistics
- Learning from Data



Navigating Chaos through Data

“What if we stop explaining everything?”

By the 1990s, AI researchers had learned a painful lesson: the world is too complicated to write down in rules. Instead of telling machines how to solve problems, a new idea took hold: What if machines could learn from experience, the way humans do?



MACHINE LEARNING SHIFT (1990s)

This was not entirely new. Decades earlier, scientists had already tried something like this.

THE PERCEPTRON: EARLY AI (1950s)

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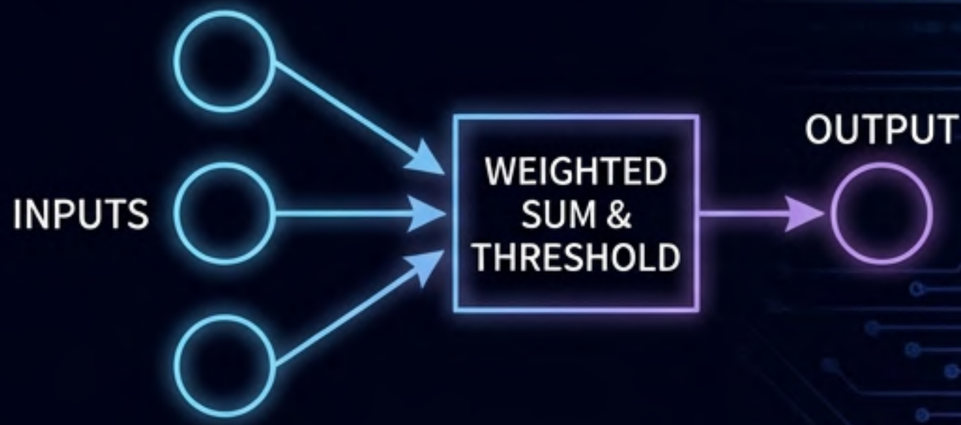
Frank Rosenblatt’s Mathematical Neuron Model



Inspired by the Brain
Simple Neuron Model
Received Inputs
Weighed Them
Produced an Output

THE PERCEPTRON: DREAM, LIMITS, & REVIVAL

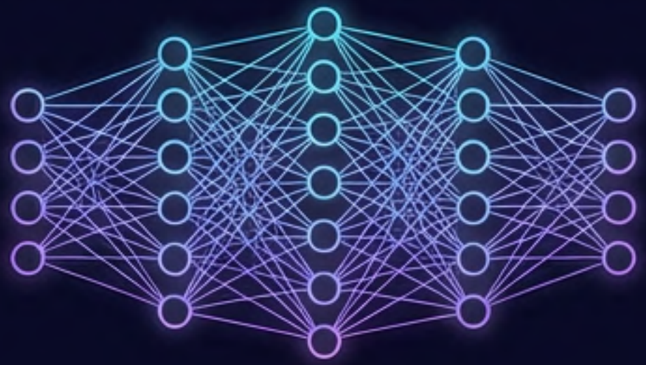
THE DREAM:
CONNECTING MANY
= INTELLIGENCE

CRITIQUE (LATE 1960s):
FIELD TURNED AWAY

THE REVIVAL:
NOT WRONG,
JUST TOO EARLY

NEURAL NETWORKS COME BACK QUIETLY (1980s-1990s)

THE REVIVAL: LAYERS OF SIMPLE UNITS



REPEATED MILLIONS OF TIMES

NOT PROGRAMMED
(NO RULES)

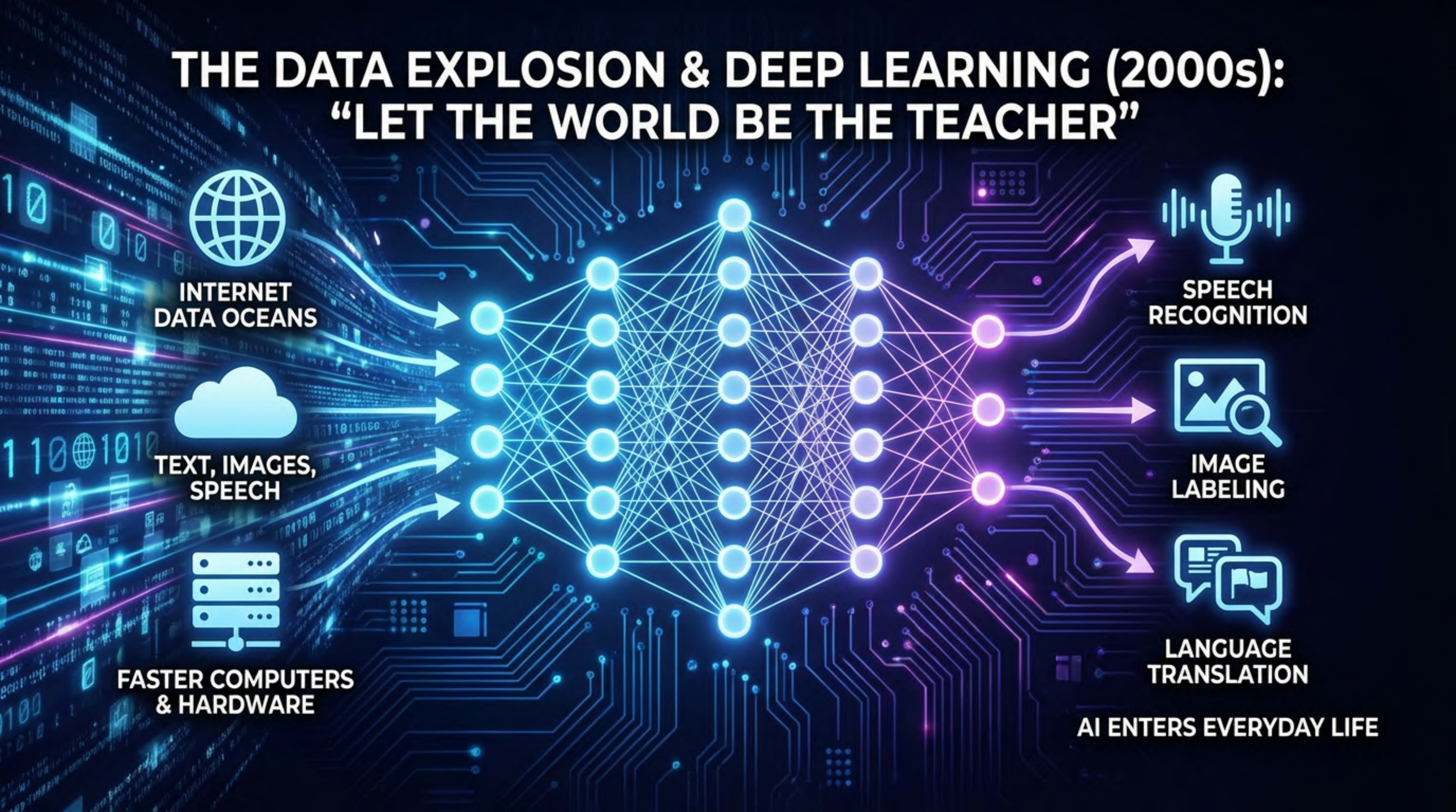
NOT PROGRAMMED
(NO RULES)

TRAINED
(FINDING PATTERNS)

TRAINED
(FINDING PATTERNS)

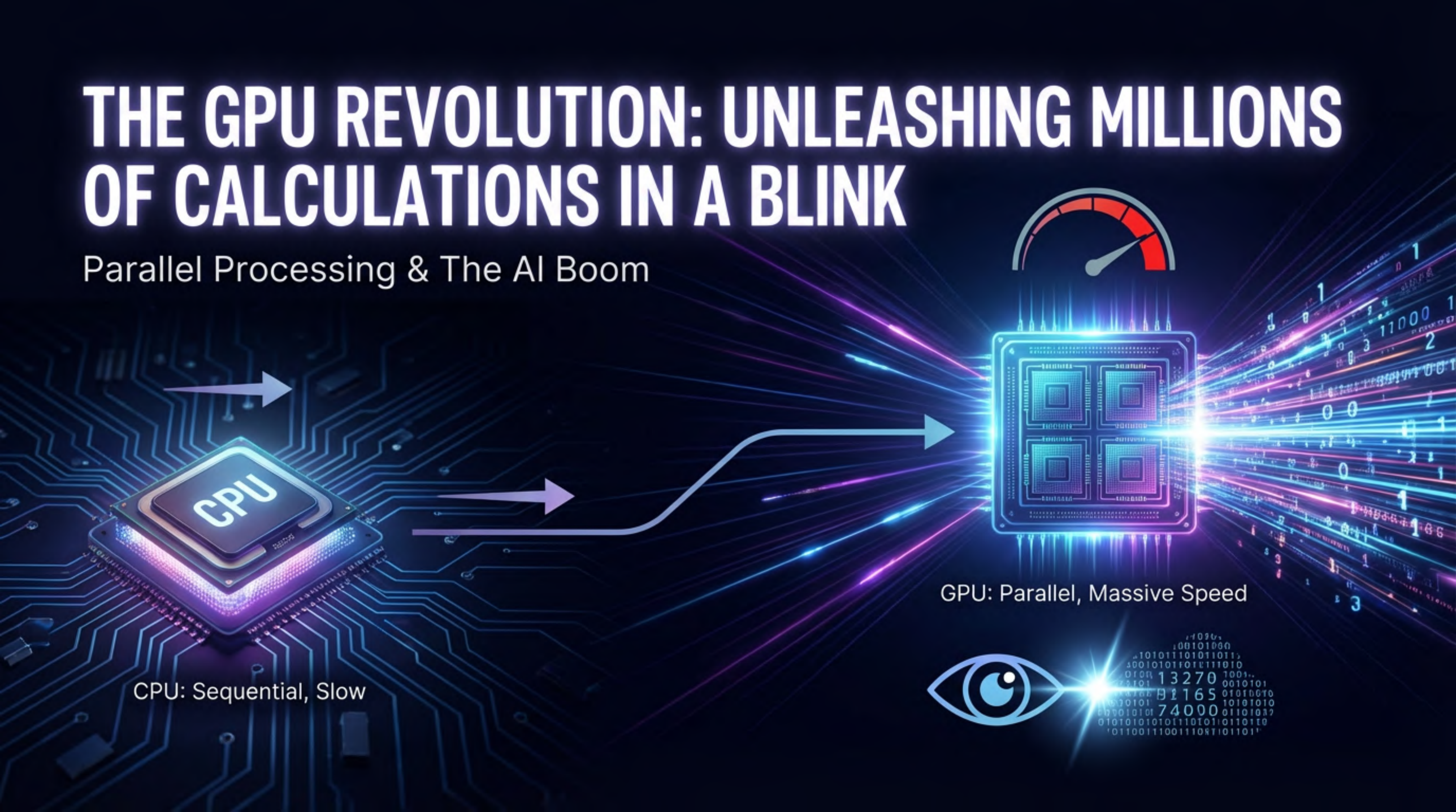
THE BIG SHIFT: PROGRAMMING -> TRAINING

THE DATA EXPLOSION & DEEP LEARNING (2000s): "LET THE WORLD BE THE TEACHER"

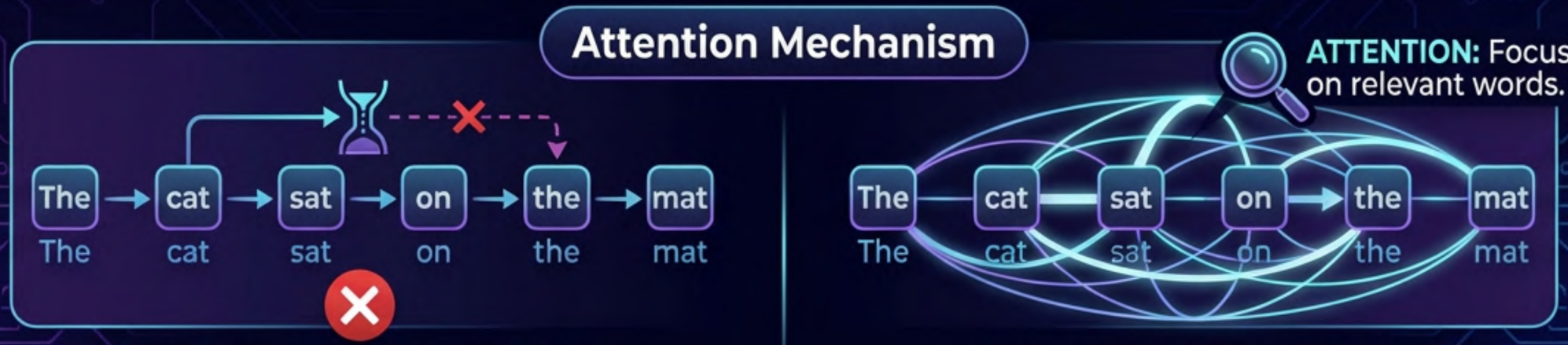


THE GPU REVOLUTION: UNLEASHING MILLIONS OF CALCULATIONS IN A BLINK

Parallel Processing & The AI Boom



THE TRANSFORMER REVOLUTION (Late 2010s):
"WHAT IF ATTENTION IS ENOUGH?"



EARLIER NEURAL NETWORKS
(Sequential Processing)

TRANSFORMER ARCHITECTURE
(Parallel, Self-Attention)

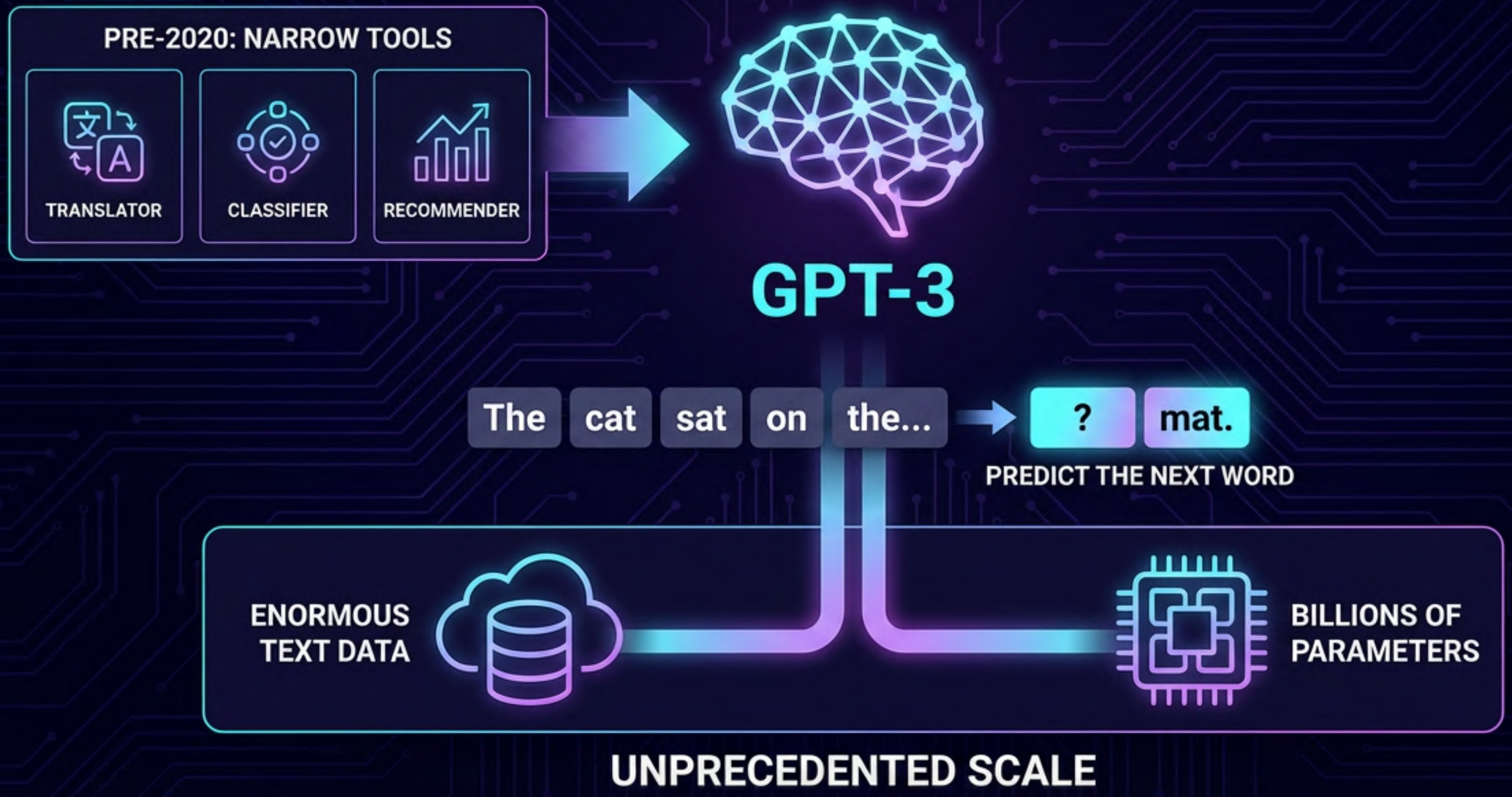
LOOKS AT ALL WORDS AT ONCE

MASSIVE TEXT EXPOSURE

TRANSFORMER MODEL

LEARNED LANGUAGE BEHAVIOR
(Context & Relationships)

THE MOMENT LANGUAGE WOKE UP (2020)



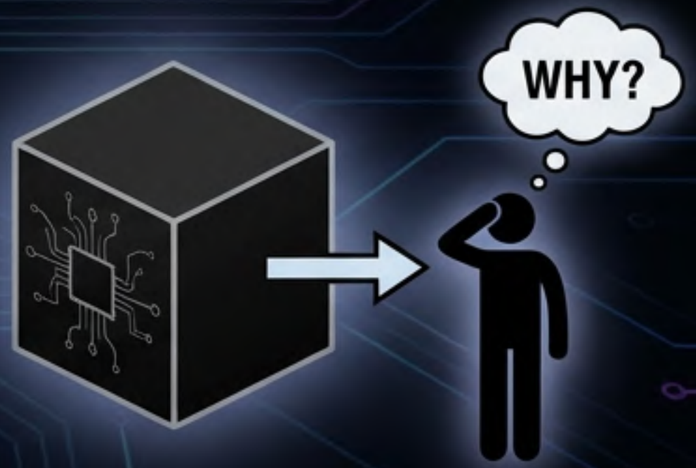
AI LIMITATIONS: A HISTORICAL PERSPECTIVE

NO REAL UNDERSTANDING

SYMBOL MANIPULATION, NOT MEANING

LACK OF REAL-WORLD GROUNDING

THE “FLOATING INTELLIGENCE” PROBLEM



EXPLAINABILITY CHALLENGE

(WHY DID IT DO THAT?)

THANKS FOR WATCHING

The Journey of AI Continues...