

History of A.I.



Matthew Renze

DATA SCIENCE CONSULTANT

@matthewrenze matthewrenze.com

Overview



Classical A.I.

First A.I. Winter

Knowledge-based A.I.

Second A.I. Winter

Data-driven A.I.

Third A.I. Winter

Classical A.I.



Advances in Classic A.I.

**Computational
search**

**Computational
logic**

**Natural
language
processing**

Successes of Classic A.I.

**General
Problem
Solver**

ELIZA

SHRDLU

First A.I. Winter

Limitations of Classic A.I.

**Limited
computer
power**

**Computational
complexity**
of non trivial problems

**Symbolic
computing
limitations**

Failures of Classical A.I.

**Machine
translation
deficiencies**

a neural network
**Perceptron
limitations**

**Lighthill
report**





First A.I. Winter
1974 – 1980

Knowledge-based A.I.



Advances in Knowledge-based A.I.

a computer program that can answer questions or solve problems in a limited domain of knowledge

**Expert
system**

a set of facts and a set of rules that connected them.

**Knowledge
base**

deduce new facts from facts already in the knowledge base

**Inference
engine**

Successes of Knowledge-based A.I.

MYCIN
diagnoses
diseases

XCON
manages
inventory

AARON
creates
paintings

Second A.I. Winter

Limitations of Knowledge-based A.I.

**Expensive
to maintain**

**Rigid and
inflexible**

**Not very
efficient**

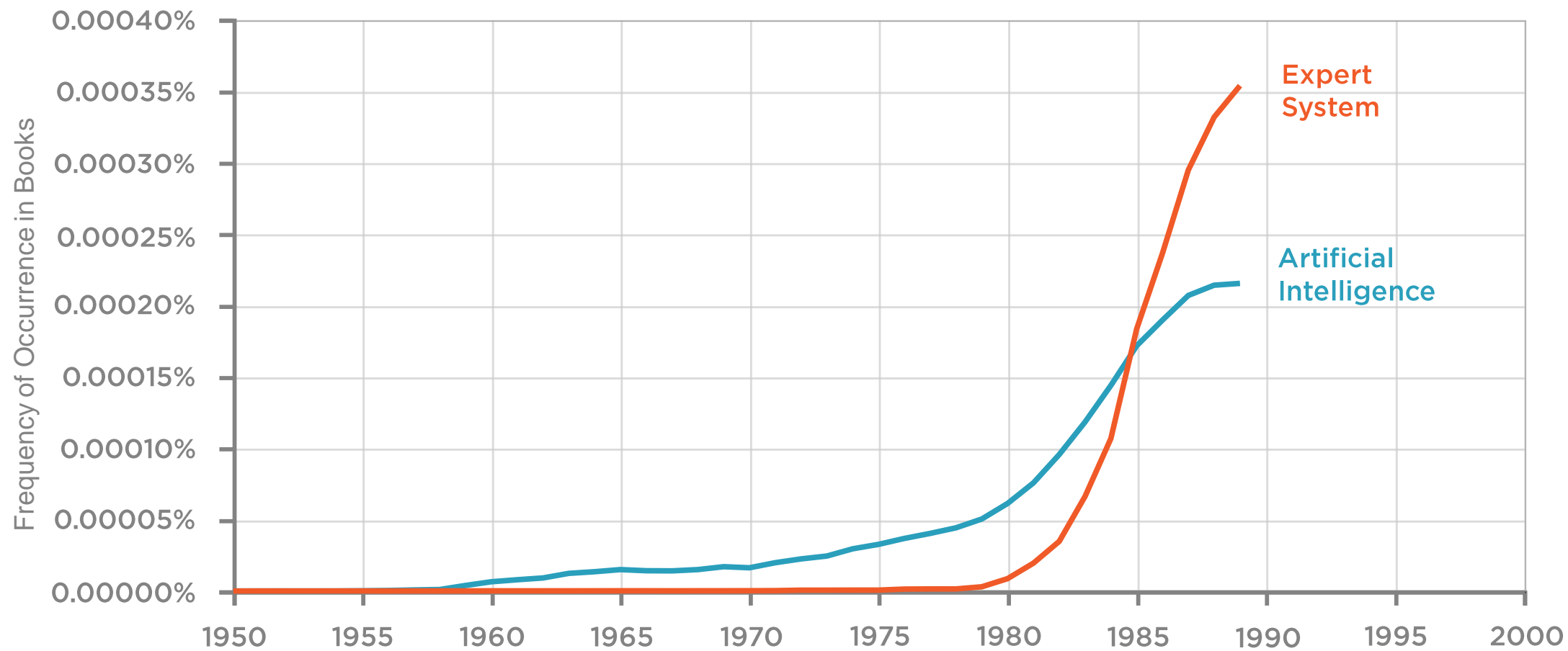
Failures of Knowledge-based A.I.

**MYCIN
never reaches
production**

**Collapse of the
LISP machine
market**

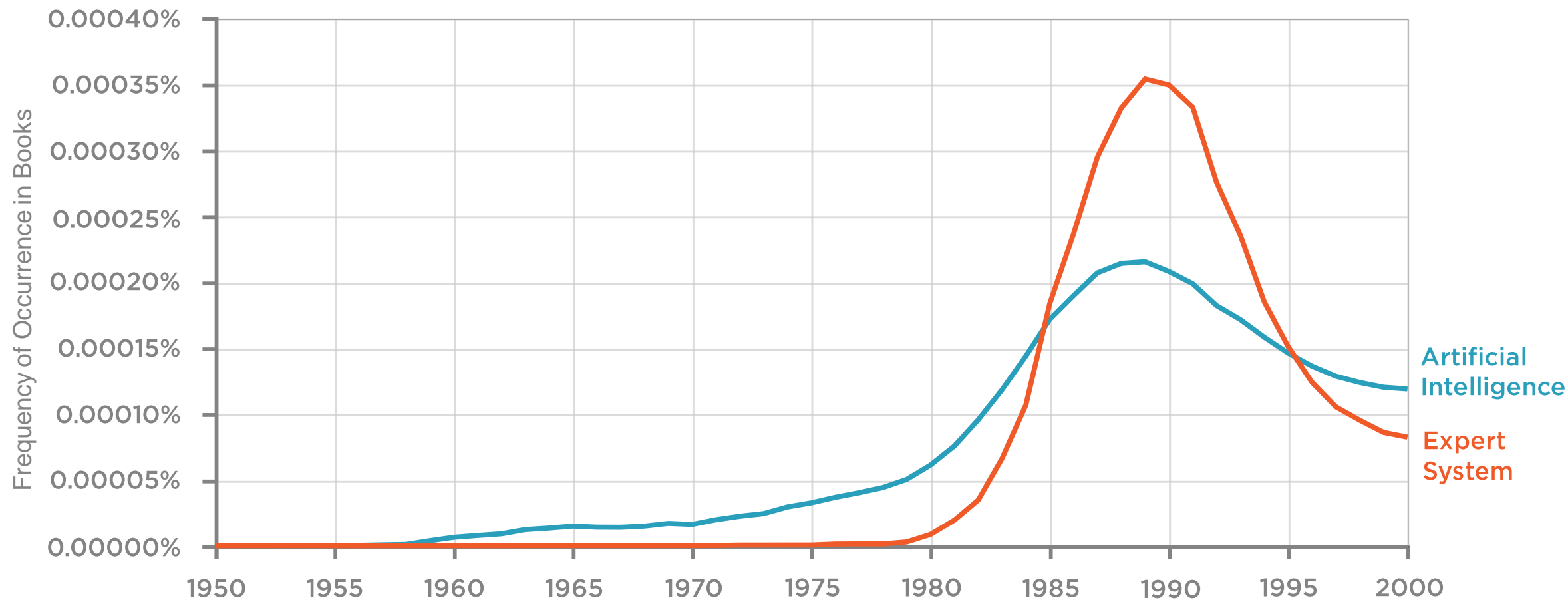
**5th Generation
Computer
Systems Project**

Second A.I. Winter



Source: Google Books Ngram Viewer

Second A.I. Winter



Source: Google Books Ngram Viewer





Second A.I. Winter 1988 - 2000s

Data-driven A.I.



Advances in Data-driven A.I.

**More
compute**

**More
data**

**Better
algorithms**

**More
discipline**

Successes in Data-driven A.I.

**Stanley
completes
DARPA GC**

**Watson
wins
Jeopardy**

**AlphaGo
wins at
Go**

Third A.I. Winter

Limitations of Data-driven A.I.

**Lacks
the ability
to reason**

**Requires
labeled
data**

**Only learns
what you
teach it**

Failures of Data-driven A.I.

**Self-driving
vehicle
collisions**

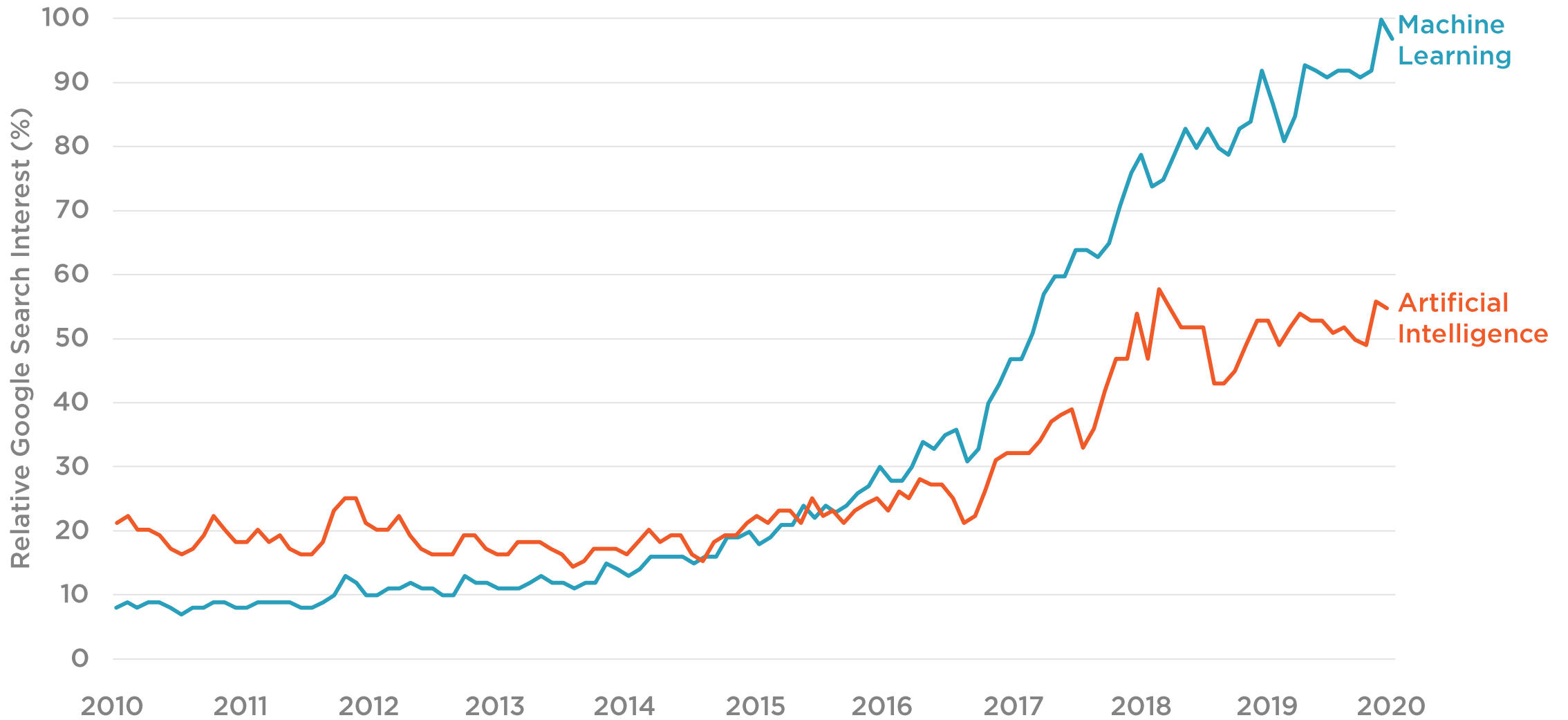
**Chat bot
learns
racism**

**Watson
fails as
a doctor**



A Third A.I. Winter?

A Third A.I. Winter?



Summary

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