



Getting Started with AI: Module 1 - What is AI?



Getting Started with AI

- **Module 1: What is AI?**

A high-level overview of the concepts, history and vocabulary of AI.

- **Module 2: Understanding AI Models**

Hands on experience with three AI models intended to prime understanding of how they work.

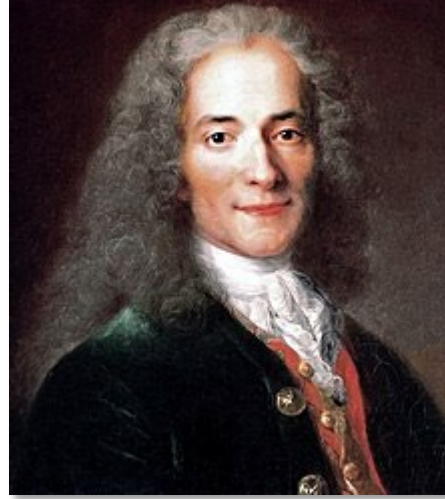
- **Module 3: The AI Application Development Cycle**

A crash course in the steps to develop an AI application.

- **Module 4: A Very Brief Introduction to Ethics in AI**

A look at industry adopted principles that guide ethical AI development.



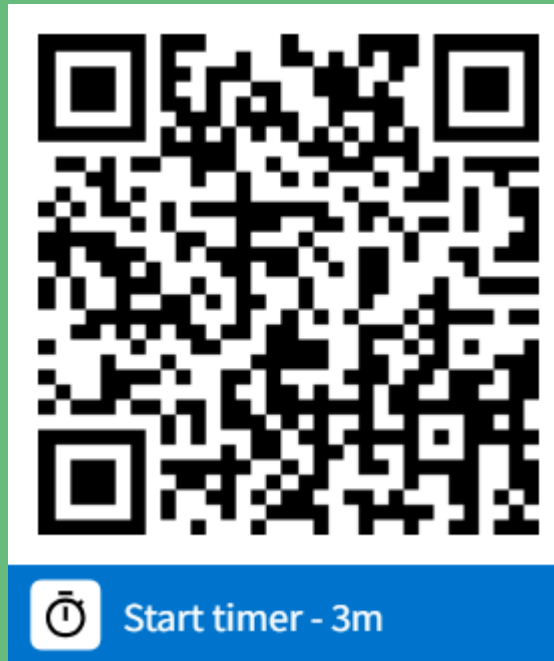


Define your terms ... or we shall never
understand one another

Voltaire



How would you define Artificial Intelligence?

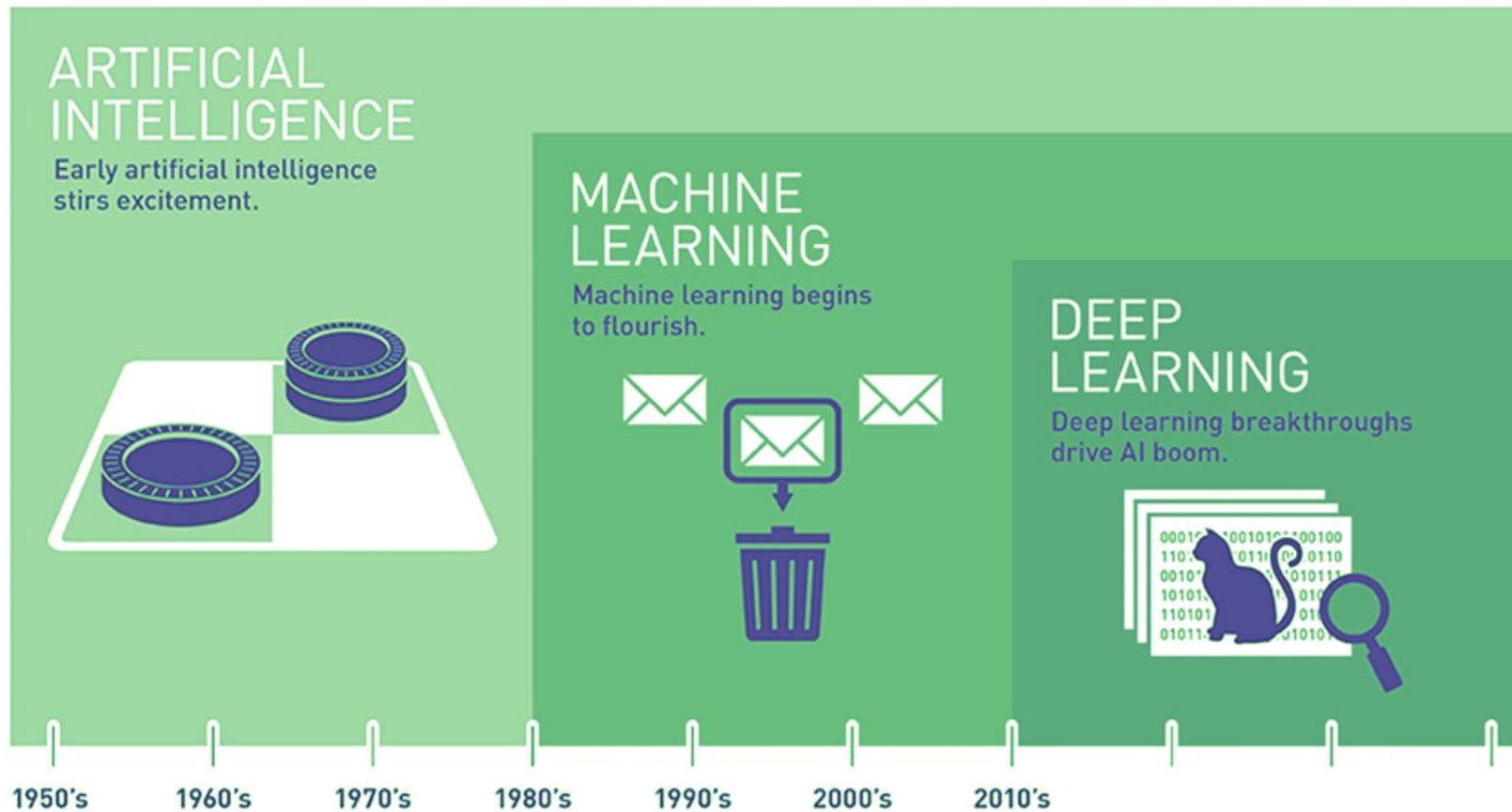


Artificial Intelligence is the study of “rational agents”: any system that perceives its environment and takes actions that maximize its chance of achieving its goals.

- Russell & Norvig (2003)



AI is Expansive



ML / DL Comparison

Machine Learning

- 1990's - Present
- Statistics & Math
- Sci-Kit Learn / RAPIDS



Deep Learning

- 2010 - Present
- Artificial Neuron
- Tensorflow / Pytorch



*Machine learning is the field of study
that gives computers the ability to learn without
being explicitly programmed.*

- Arthur Samuel (1959)

Machine learning is the science and art of programming
computers so they can learn from data.

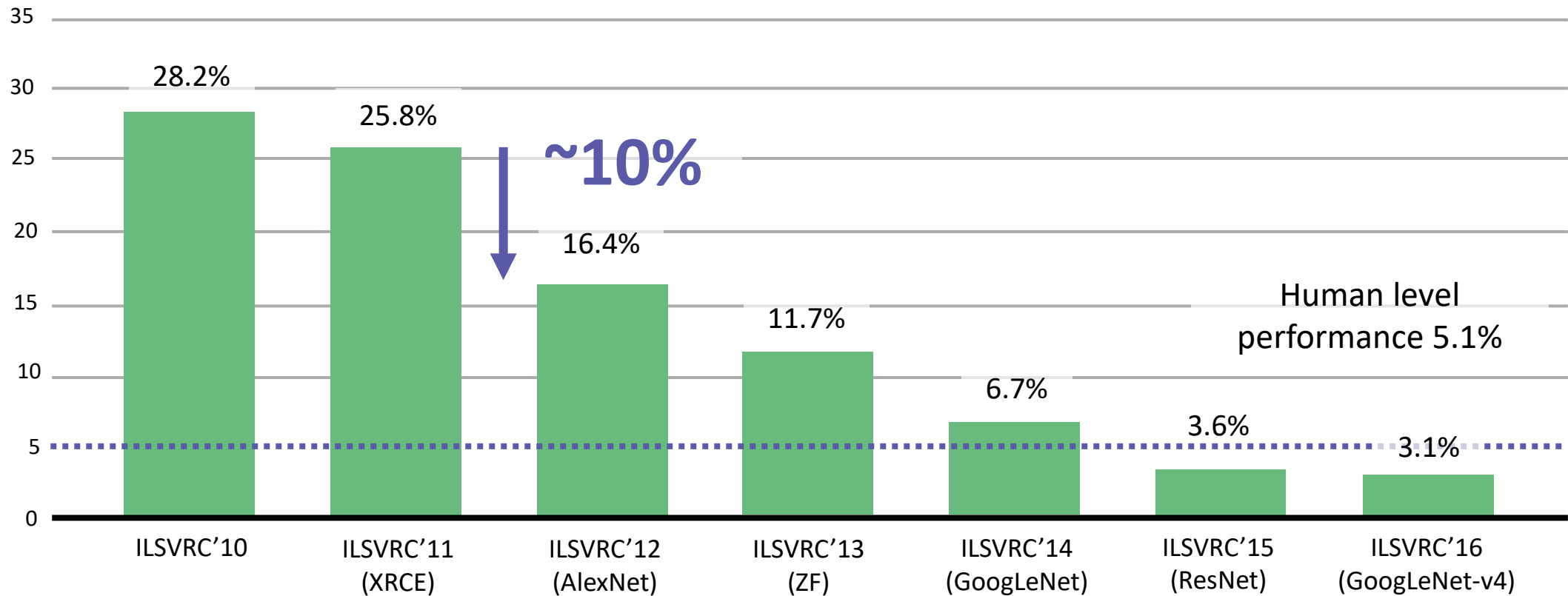
- Aurélien Géron



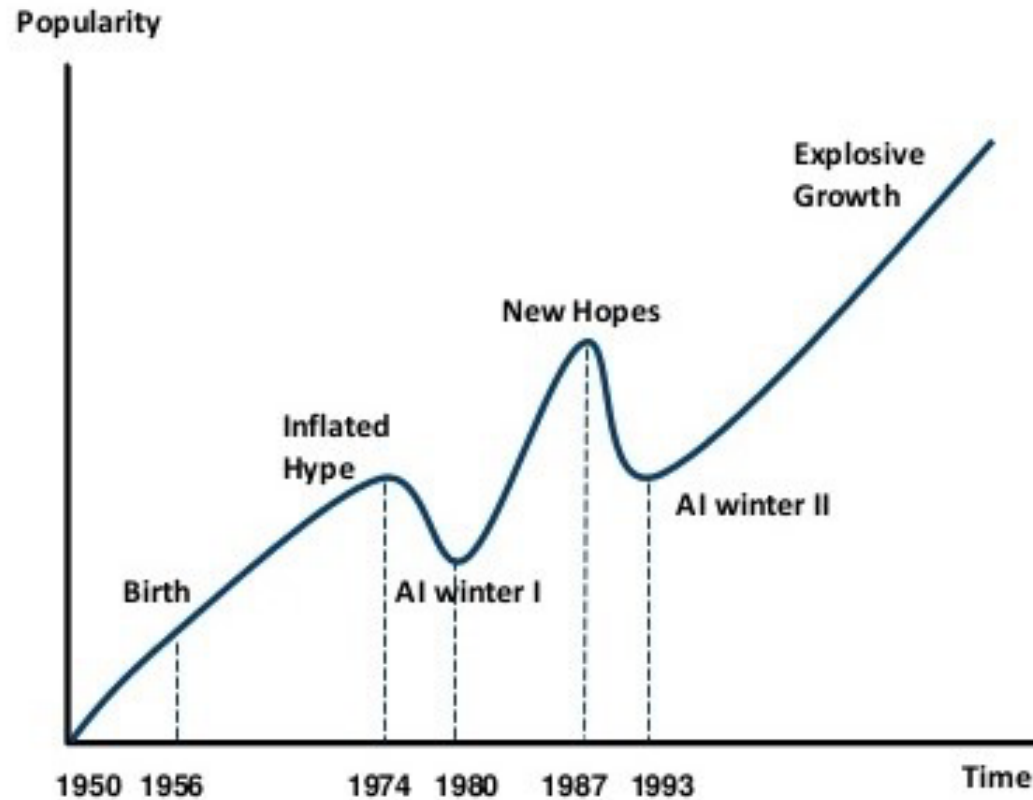
Deep Learning



Deep Learning Reduced Image Classification Error 10% in 1-year



AI Has a Long History of Being “The Next Big Thing”...



Timeline of AI Development

- **1950s-1960s:** First AI boom - the age of reasoning, prototype AI developed
- **1970s:** AI winter I
- **1980s-1990s:** Second AI boom: the age of Knowledge representation (appearance of expert systems capable of reproducing human decision-making)
- **1990s:** AI winter II
- **1997:** Deep Blue beats Gary Kasparov
- **2006:** University of Toronto develops Deep Learning
- **2011:** IBM's Watson won Jeopardy
- **2016:** Go software based on Deep Learning beats world's champions



Origin of "AI"!



A Proposal for the
DARTMOUTH SUMMER RESEARCH PROJECT ON ARTIFICIAL INTELLIGENCE

We propose that a 2 month, 10 man study of artificial intelligence be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire. The study is to proceed on the basis of the conjecture that 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. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves. We think that a significant advance can be made in one or more of these problems if a carefully selected group of scientists work on it together for a summer.





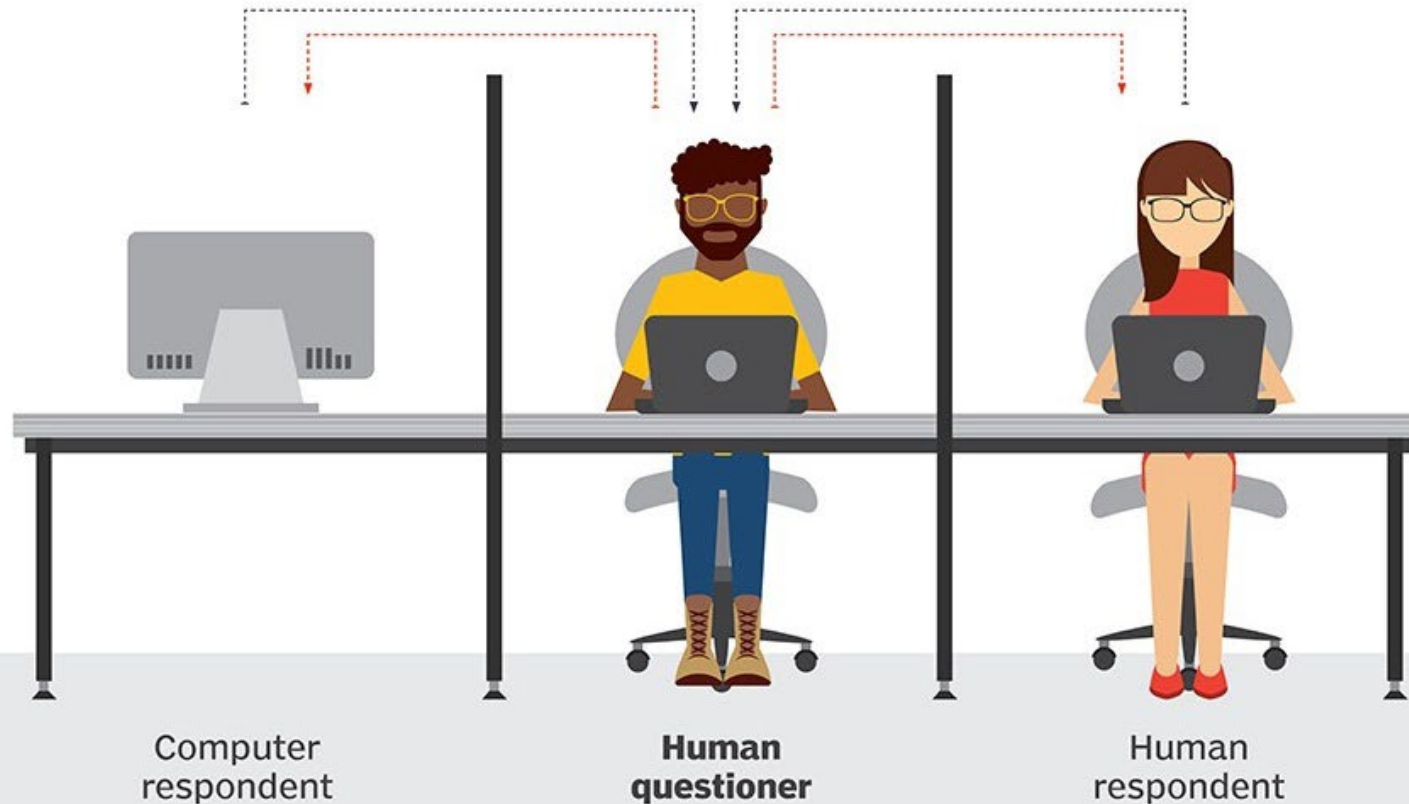
Alan Turing



Turing test

During the Turing test, the human questioner asks a series of questions to both respondents. After the specified time, the questioner tries to decide which terminal is operated by the human respondent and which terminal is operated by the computer.

■ QUESTION TO RESPONDENTS ■ ANSWERS TO QUESTIONER



Advances in artificial intelligence (AI) have given the world computers that can beat people at chess and "Jeopardy!" as well as drive cars and manage calendars. But despite the progress, engineers are still years away from developing machines that are self-aware. Some believe the resulting **technological singularity** will eradicate poverty and disease, while others warn it could endanger human survival.



1950: Isaac Asimov publishes the influential sci-fi story collection **"I, Robot."** (Left: 2004 film version of "I, Robot")



1950: Alan Turing introduces the **Turing test** in his paper "Computing Machinery and Intelligence." (Credit: National Portrait Gallery, London)

Summer of 1956: Dartmouth conference launches the field of AI and **coins the term "artificial intelligence."** (Right: room-filling IBM-702 computer, as used by first AI researchers)



1968: "2001: A Space Odyssey," the book by Arthur C. Clarke and film by Stanley Kubrick, features the sentient and deadly computer **HAL 9000.**

1974-early 1980s: The first **Winter of AI**, a period of reduced funding and lowered interest in the field as hype turned to disappointment.



1984: The first **"Terminator"** film depicts a near-future world overtaken by killing machines run by the artificial intelligence Skynet.



1978: The original "Battlestar Galactica" science fiction TV series introduces warrior robots called **Cylons.**

September 28, 1987: The TV series "Star Trek: The Next Generation" introduces the self-aware android **Lieutenant Commander Data.**



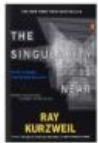
May 11, 1997: **IBM's Deep Blue computer** beats reigning world chess champion Garry Kasparov. (Credit: Shutterstock)

June 29, 2001: Steven Spielberg releases his version of a film – originally developed by Stanley Kubrick – about a robot boy: **"A.I.: Artificial Intelligence."**



2005: A Stanford vehicle wins the **DARPA grand challenge**, driving autonomously across the desert for 131 miles (211 kilometers).

2005: Inventor and futurist Ray Kurzweil predicts an event he calls: **the Singularity** will occur around 2045, when the intelligence of artificial minds exceeds that of the human brain.



2011: **IBM's Watson** wins **"Jeopardy!"**, beating former champions Brad Rutter and Ken Jennings. (Credit: "Jeopardy!" screenshot from Wikimedia)



October 14, 2011: Apple introduces intelligent personal assistant **Siri** on the iPhone 4S.



June 2012: A Google Brain computer cluster **trains itself to recognize a cat** from millions of images in YouTube videos. (Credit: Shutterstock)



December 18, 2013: The movie "Her" (left), stars Joaquin Phoenix as a man who **falls in love with his artificially intelligent computer operating system**, voiced by Scarlett Johansson.

April 10, 2014: The film "Transcendence" (below) stars Johnny Depp as an AI researcher whose **mind is uploaded to a computer** and develops into a super-intelligence.



June 7, 2014: Chatbot Eugene Goostman is said to have **passed the Turing test** in University of Reading competition, launching controversy.

August, 2014: Researchers call for creation of a **new Turing test** to be decided at 2015 workshops.

- Deep Blue
- Watson
- Google Brain
- Eugene Goostman
- AlphaGo
- ChatGPT
- The Singularity?!

Image Credit: www.livescience.com/47544-history-of-a-i-artificial-intelligence-infographic.html



ELIZA





<https://hf.co/chat>



ChatGPT 3

chat.openai.com/auth/login





Image Credit: <https://www.rc.ufl.edu/about/hipergator/>



Image Credit:
<https://www.pcworld.com/article/416006/the-best-graphics-cards-for-pc-gaming.html>



FLOPs vs. Year

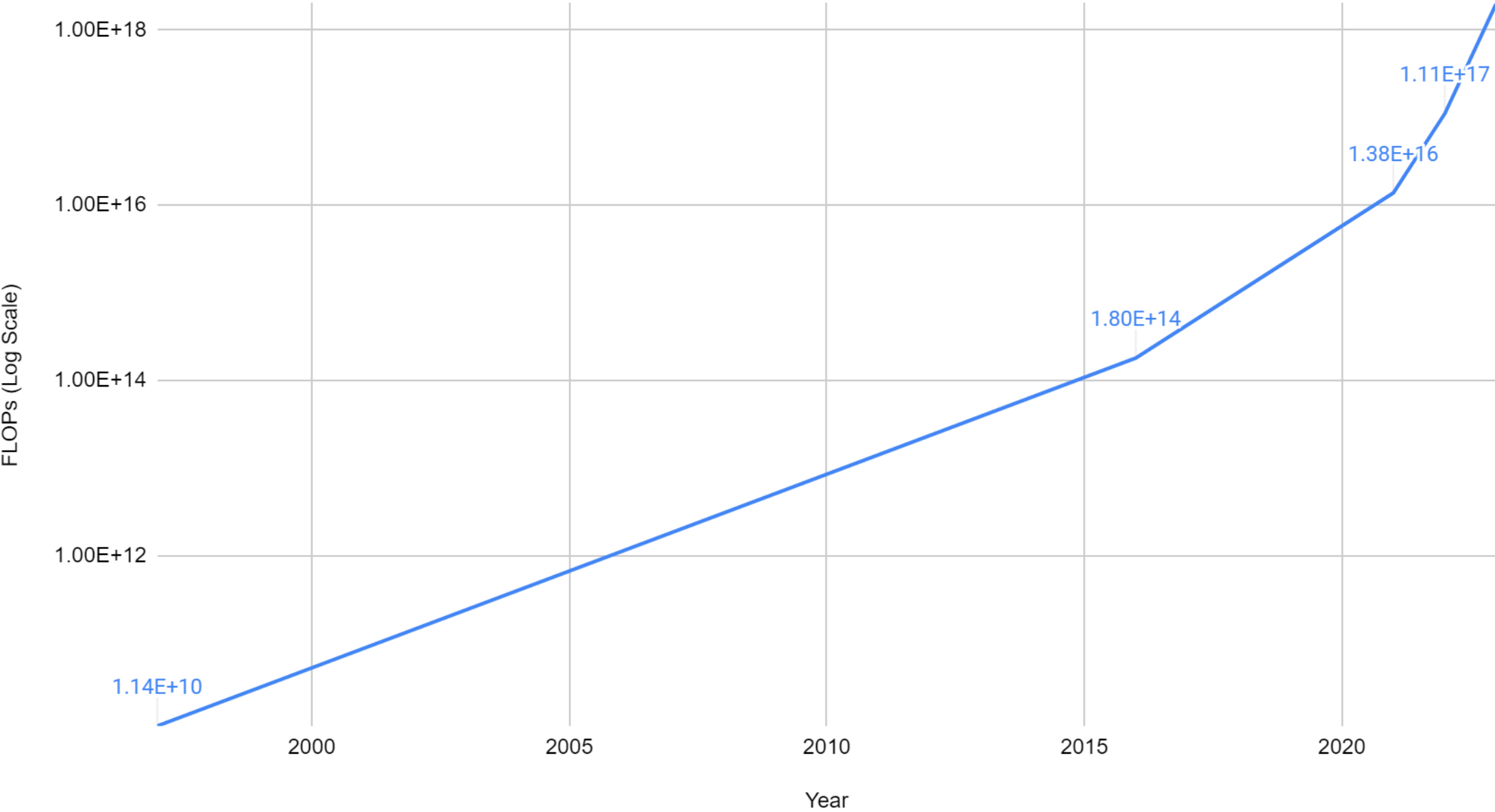




Image Credit: <https://indraidu.files.wordpress.com/2015/10/20151115205338.jpg>



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