

WELCOME

ISABELLA BICALHO-FRAZETO

machine learning engineer, data scientist & content creator



bellabf - Overview

I do some silly operations on data and people call that AI. - bellabf



Github



Datalike

We are a newsletter dedicated to put the spotlight on women's journeys and achievements in data related fields.

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substack



@bisnotforbella

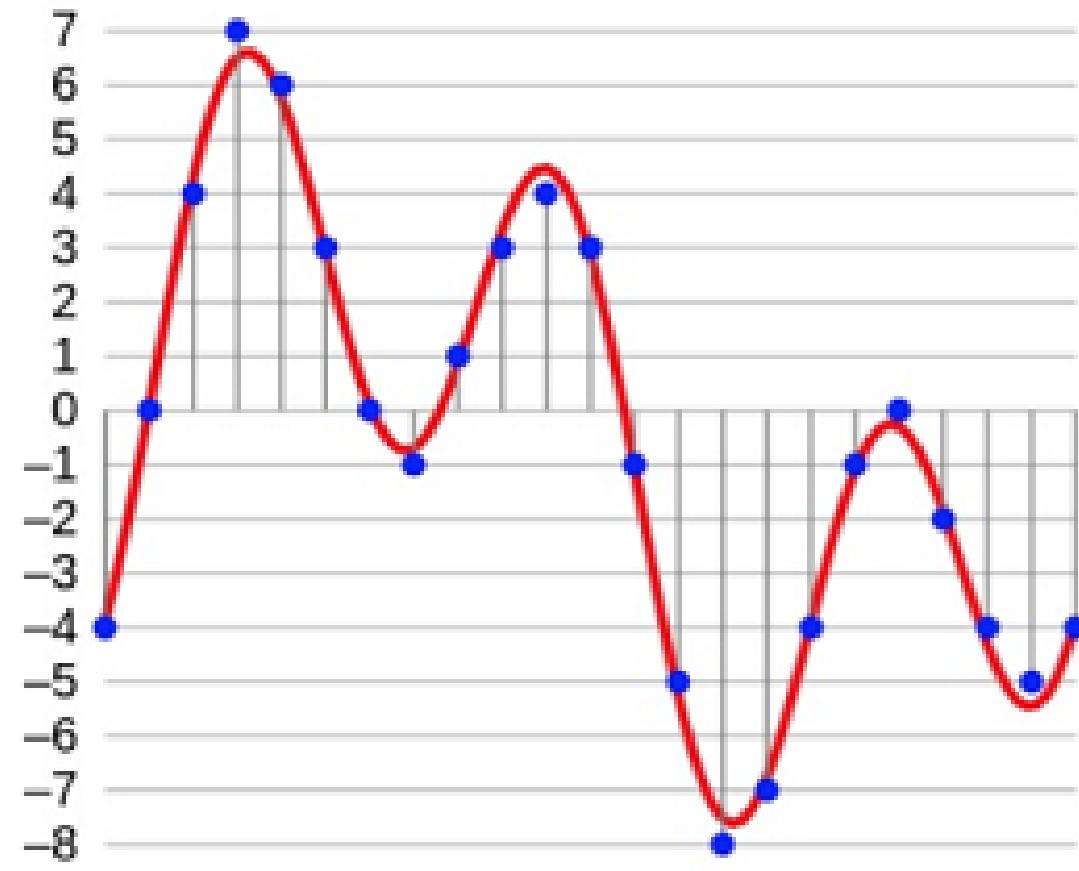
**EVERYTHING
IS A
FUNCTION**

PYTHON
EVERYTHING

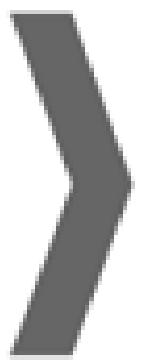
IS A
CLASS

FUCTION
FUNCTION

**EVERYTHING
CAN BE MODELED
BY A
FUNCTION**

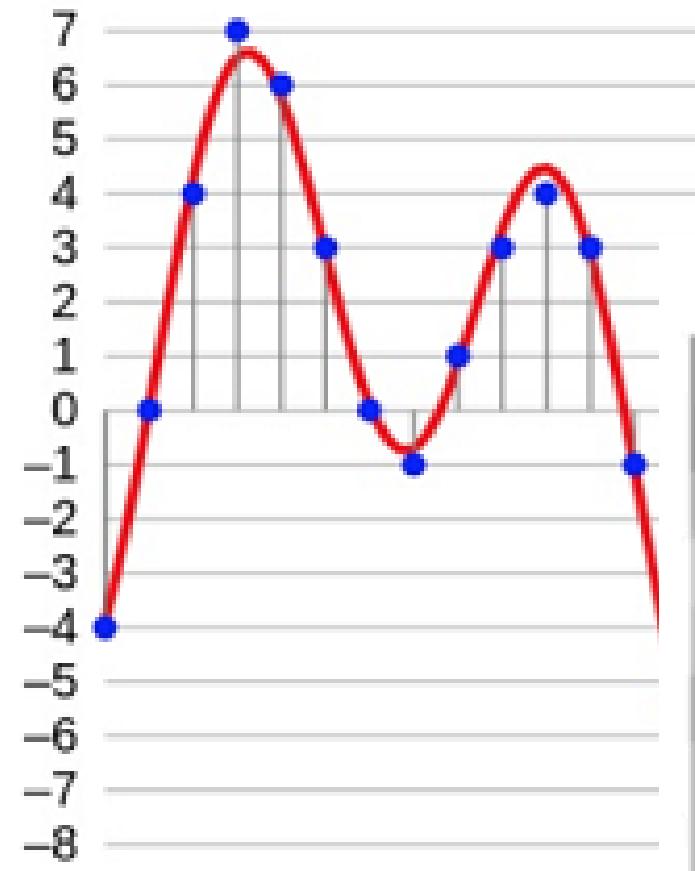


Sound wave



[
-4, 0, 4, 7, 6, 3, 0, -1, 1, 3, 4, 3,
-1, -5, -8, -7, -4, -1, 0, -2, -4, -5, -4]

Array

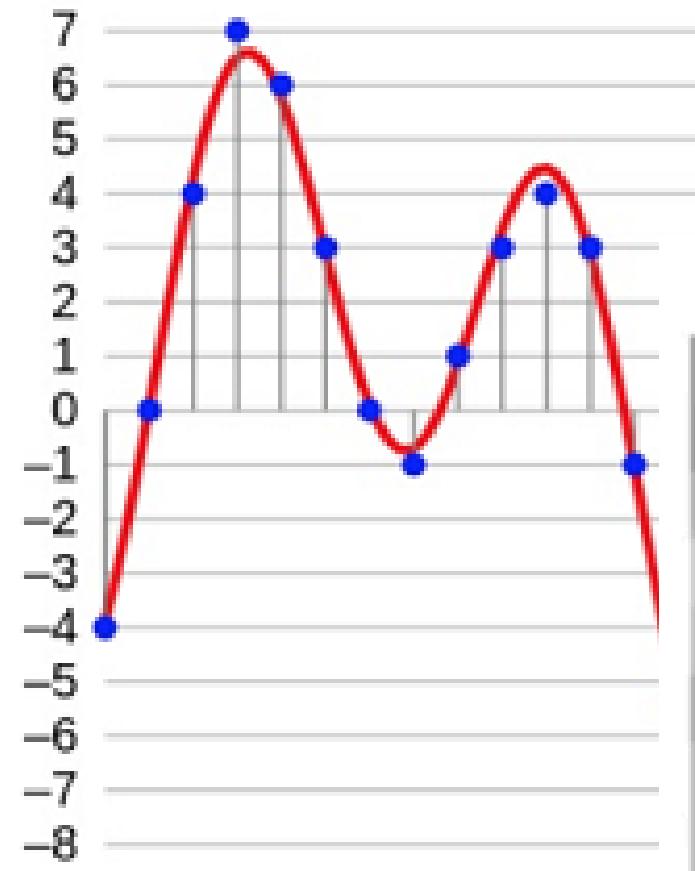


Sound wave

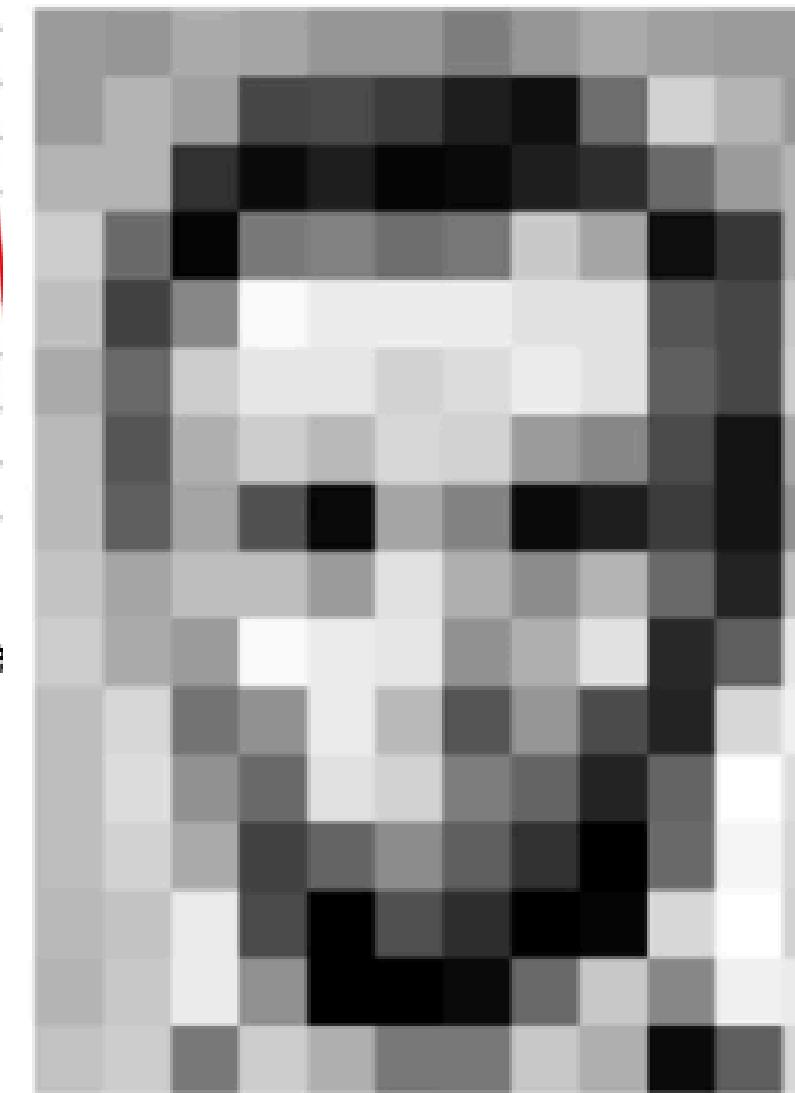


157	153	174	168	150	152	129	151	172	161	155	156
155	182	163	74	76	62	39	17	110	210	180	154
180	180	60	14	34	6	10	33	48	106	159	181
206	109	5	124	131	111	120	204	166	15	56	180
194	62	137	261	237	239	239	228	227	37	71	201
172	106	207	233	233	214	220	239	228	98	74	206
188	66	179	209	186	215	211	158	139	75	20	169
189	97	165	84	10	168	134	11	31	62	22	148
199	168	191	193	158	227	179	143	182	106	36	190
205	174	155	252	236	231	149	178	228	43	95	234

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194	62	137	261	237	239	239	228	227	37	71	201
172	106	207	233	233	214	220	239	228	98	74	206
188	66	179	209	186	215	211	158	139	75	20	169
189	97	165	84	10	168	134	11	31	62	22	148
199	168	191	193	158	227	179	143	182	106	36	190
205	174	155	252	236	231	149	178	228	43	95	234
190	216	116	149	236	187	85	150	79	34	218	241
190	234	147	168	227	210	137	162	36	101	255	224
190	214	173	66	103	143	95	80	2	109	249	215
187	196	236	75	1	81	47	0	6	217	295	211
183	202	237	145	0	0	12	108	200	138	243	236
195	206	123	287	177	121	123	200	178	19	96	218



Sound wave



157	153	174	168	150	152	129	151	172	161	155	156
155	182	163	74	76	62	39	17	110	210	180	154
180	180	60	14	34	6	10	33	48	106	159	181
206	109	5	124	131	111	120	204	166	15	56	180

- Tokenize the data

157	153	174	168	150	152	129	151	172	161	155	156
155	182	163	74	76	62	39	17	110	210	180	154
180	180	60	14	34	6	10	33	48	106	159	181
206	109	5	124	131	111	120	204	166	15	56	180

Fine Tuning is fun for all!

[34389, 13932, 278, 318, 1257, 329, 477, 0]

Fine Tuning is fun for all!

Encoding

Decoding

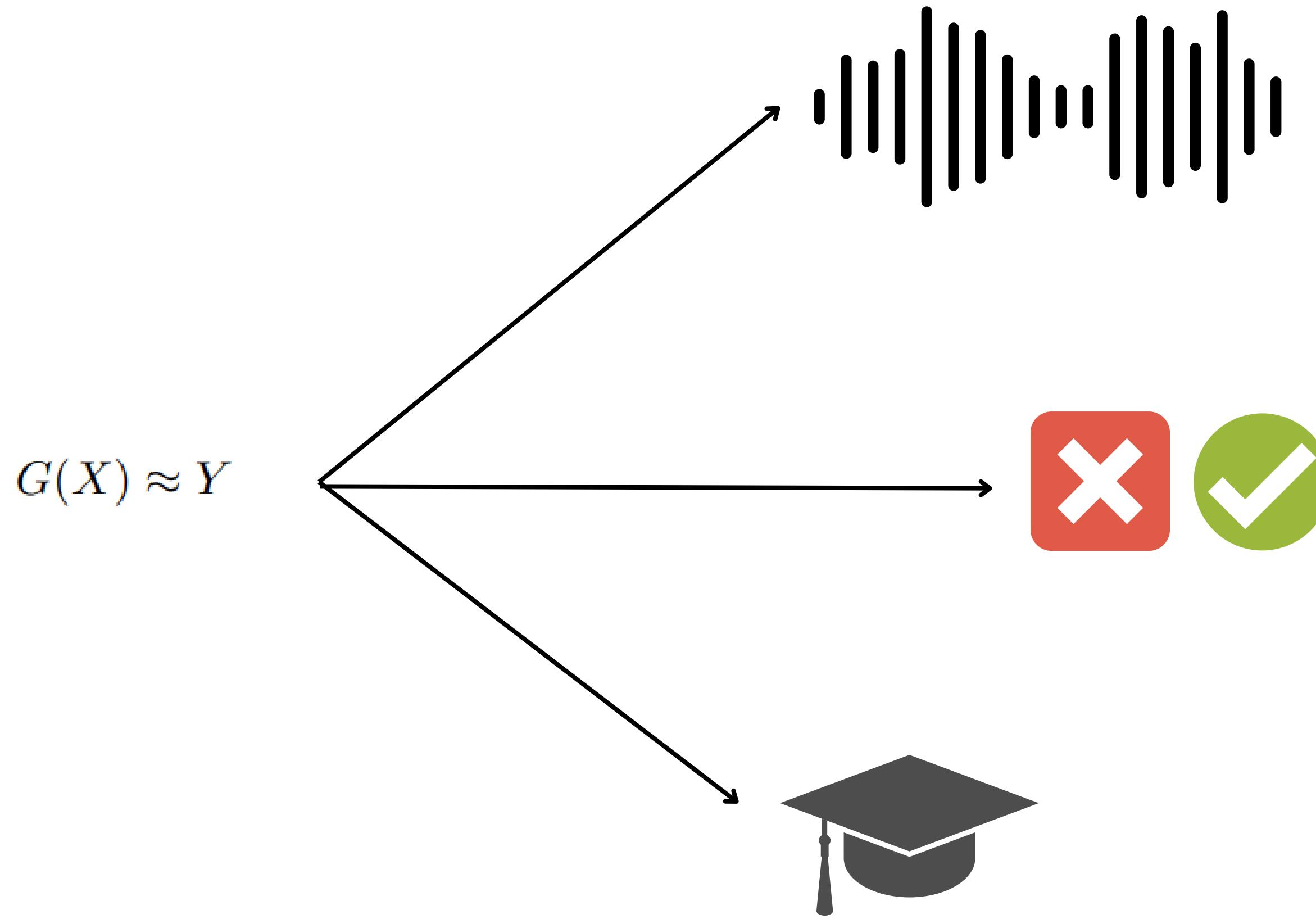
There are multiple popular tokenizers:

- Use the tokenizer associated with your model!

$$f(x) = ax + b$$

**WHAT DOES IT
HAS TO DO WITH
AI?**

AI is how we learn these functions without explicit instructions



$$G(X) \approx Y$$

$$\tilde{G(X)} \approx Y$$

Data

$$\tilde{G}(X) \approx Y$$

a way to compare your
predictions to the
data

loss function

$$\tilde{G}(X) \approx Y$$

Data

a way to compare your predictions to the data

$$\tilde{G}(X) \approx Y$$

a way to compare your
predictions to the
data

loss function

$$f(x) = ax + b$$

$$f(x) = \underbrace{ax}_\text{weight} + b$$

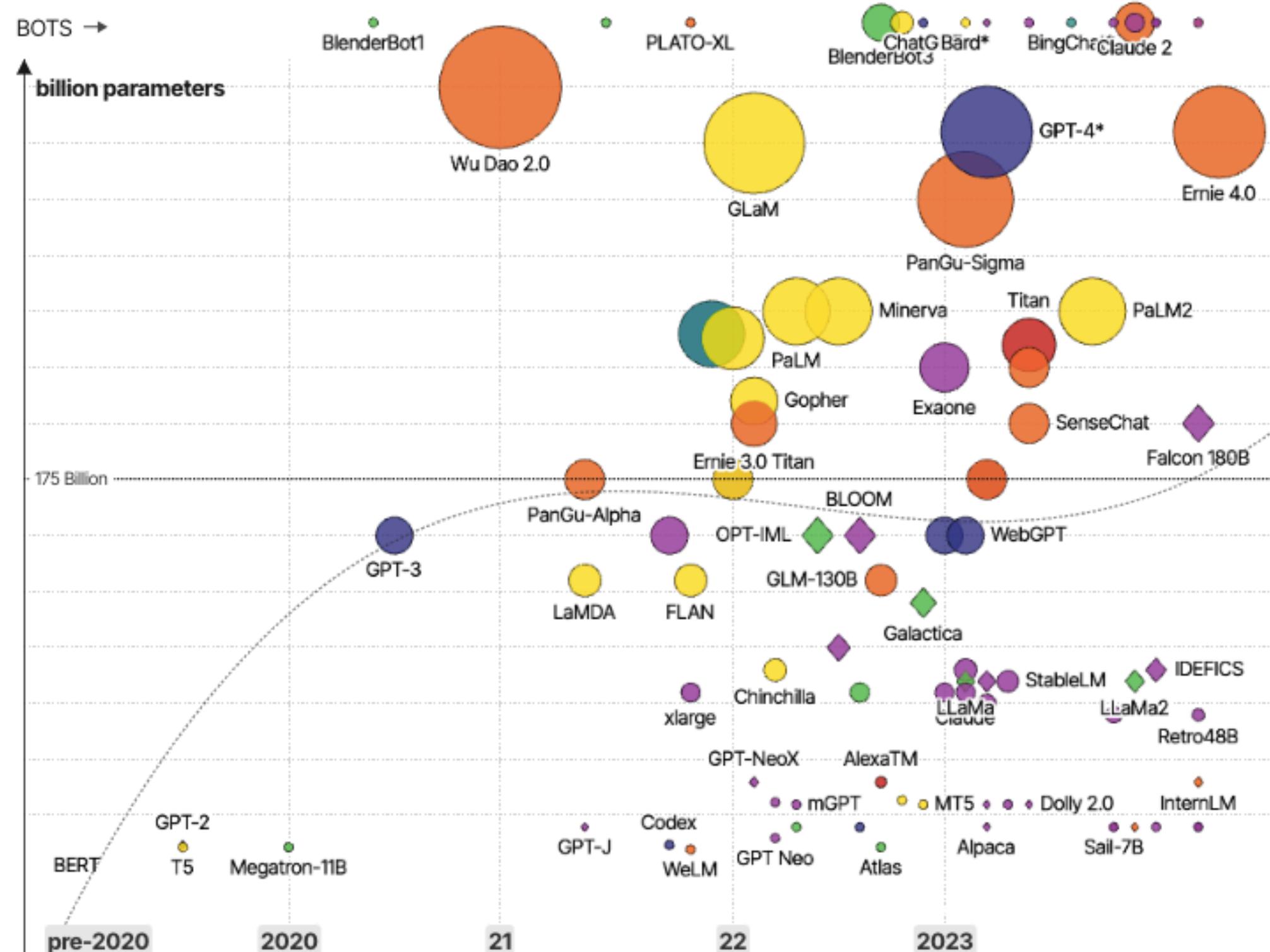
new data

bias

The Rise and Rise of A.I. Large Language Models (LLMs)

size = no. of parameters ◇ open-access

● Amazon-owned ● Chinese ● Google ● Meta / Facebook ● Microsoft ● OpenAI ● Other



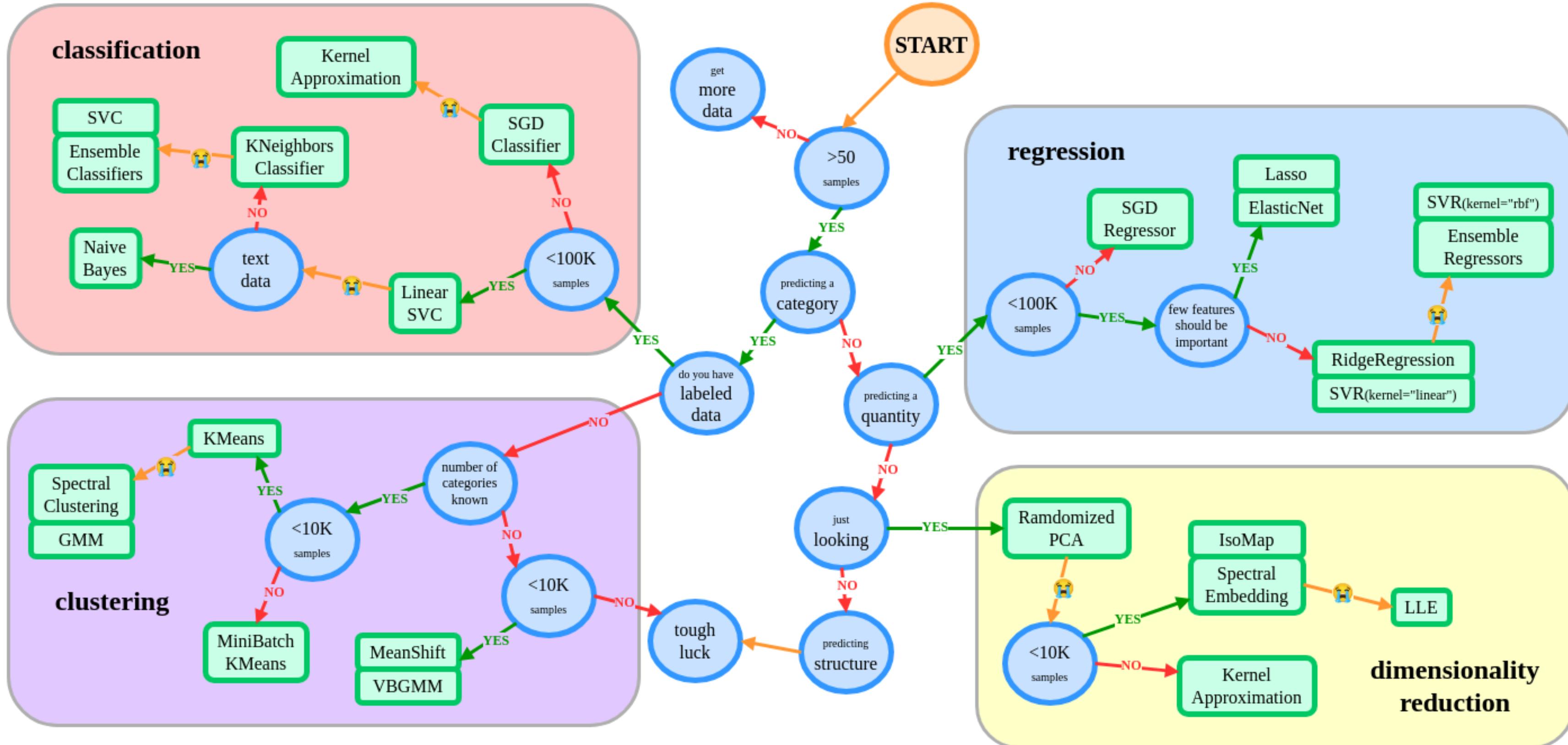
David McCandless, Tom Evans, Paul Barton
Information is Beautiful // UPDATED 2nd Nov 23

source: news reports, [LifeArchitect.ai](#)

* = parameters undisclosed // see [the data](#)

DEEP LEARNING

WE ALREADY DID AI BEFORE DEEP LEARNING

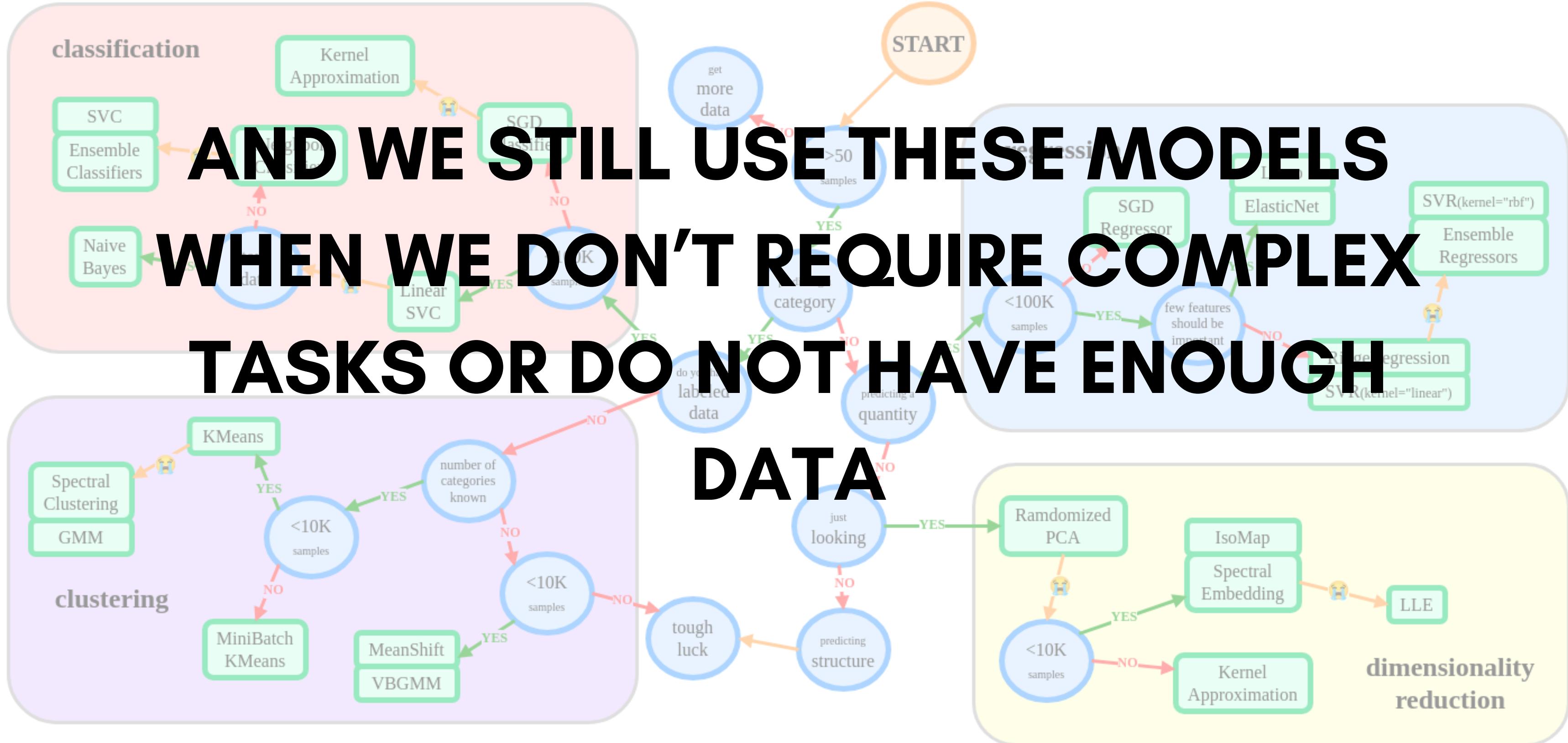


**WHAT
CHANGED?**

WHAT CHANGED?

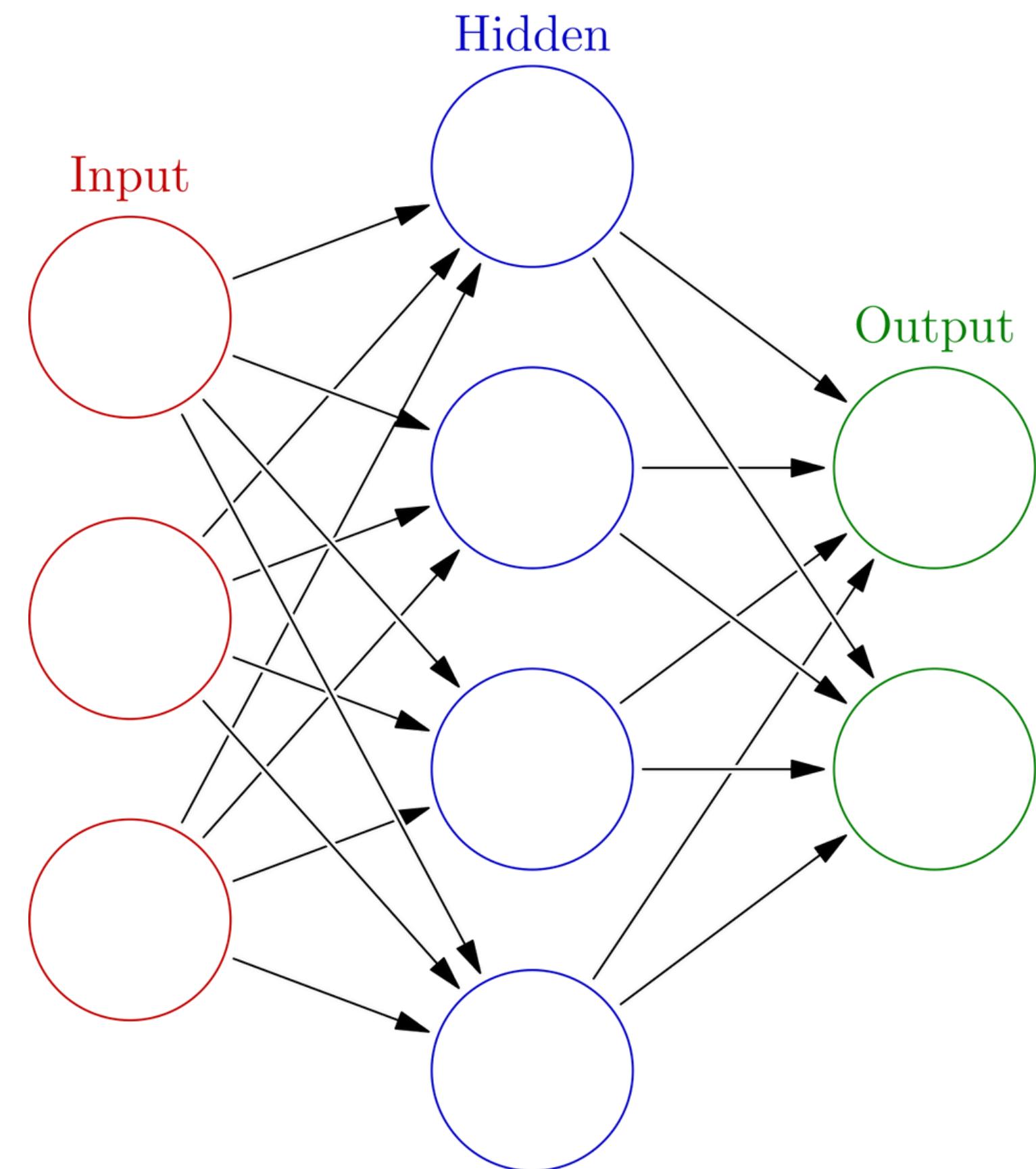
**WE CAN LEARN
MORE COMPLEX
FUNCTIONS**

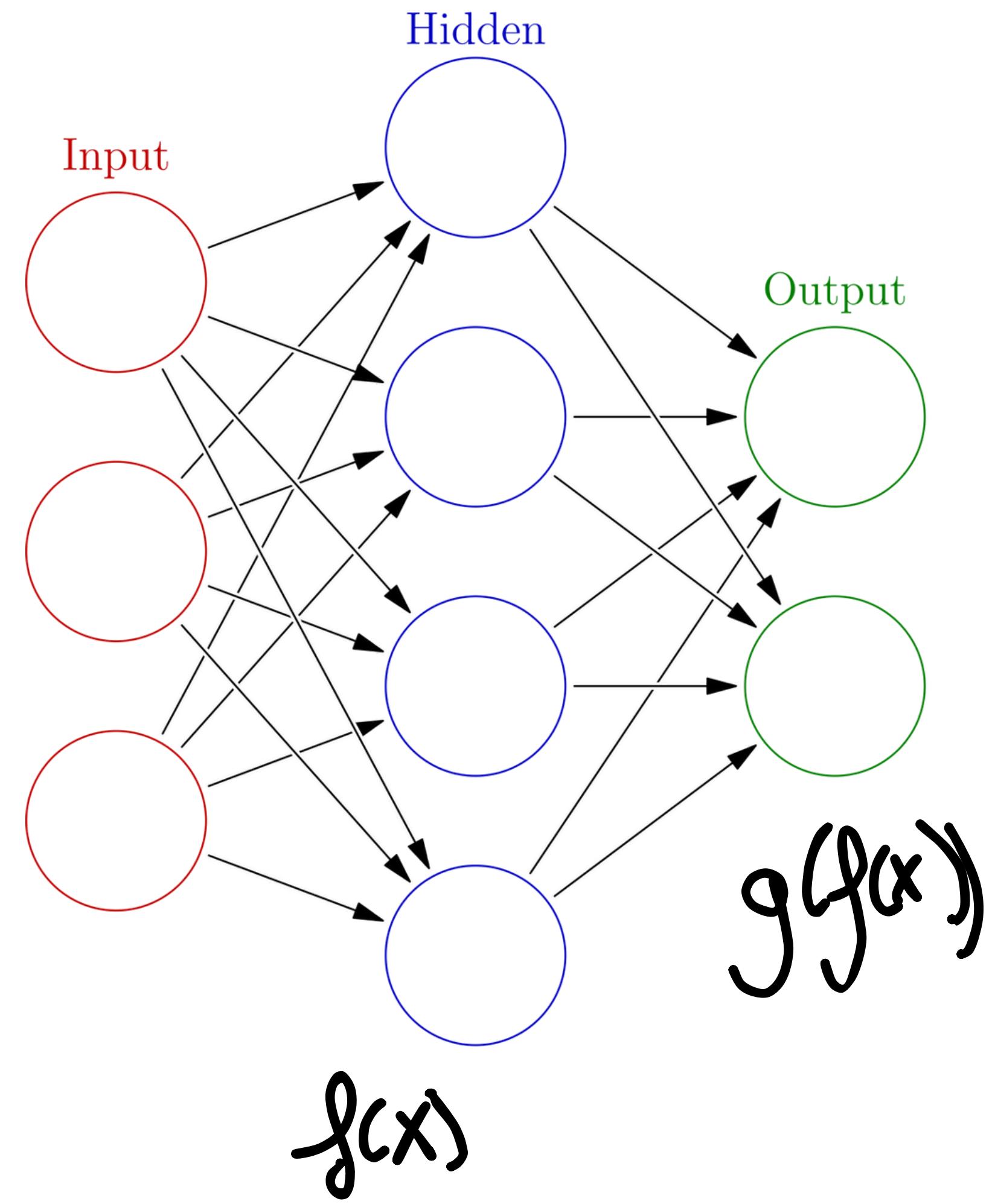
**AND WE STILL USE THESE MODELS
WHEN WE DON'T REQUIRE COMPLEX
TASKS OR DO NOT HAVE ENOUGH
DATA**

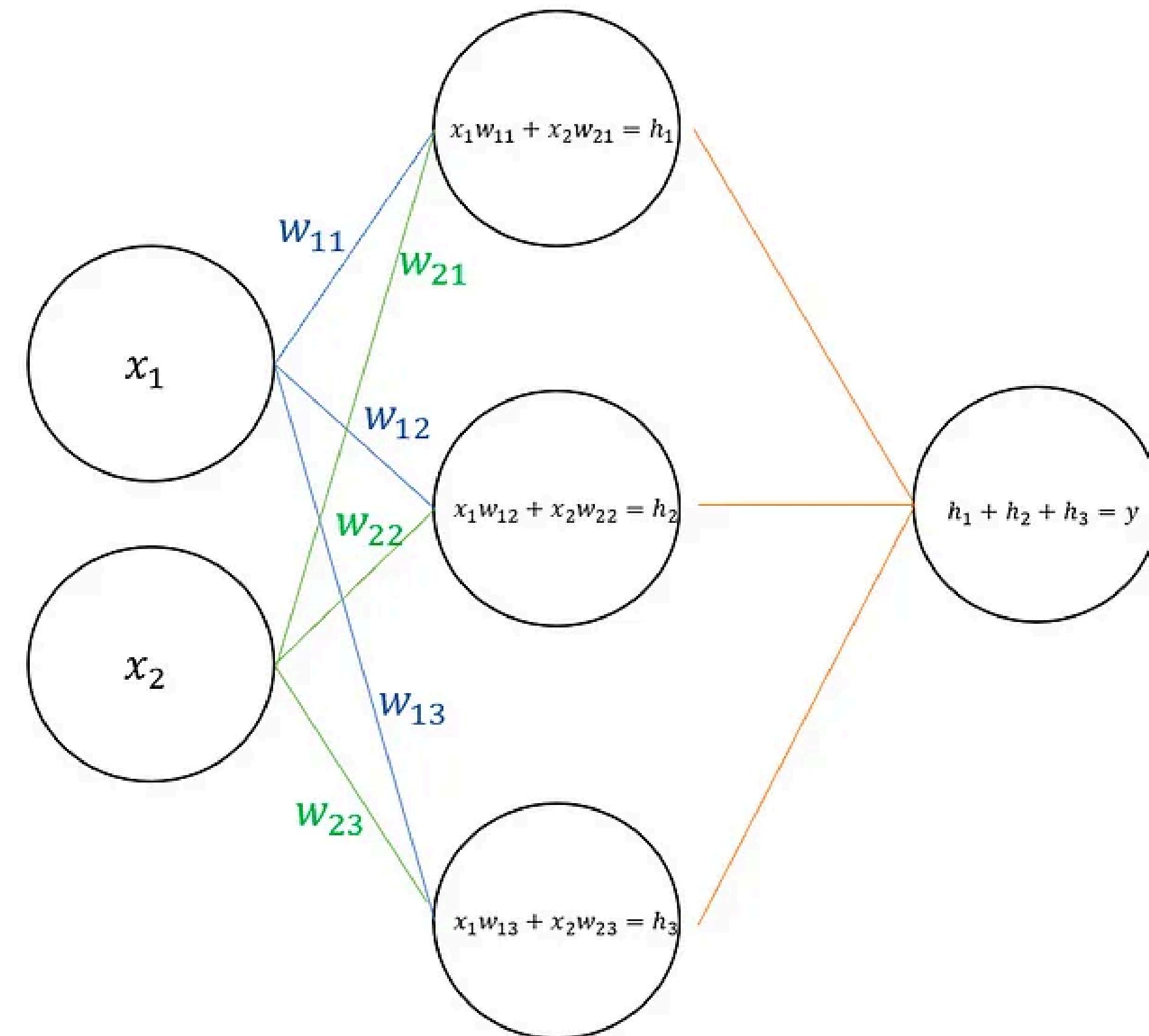


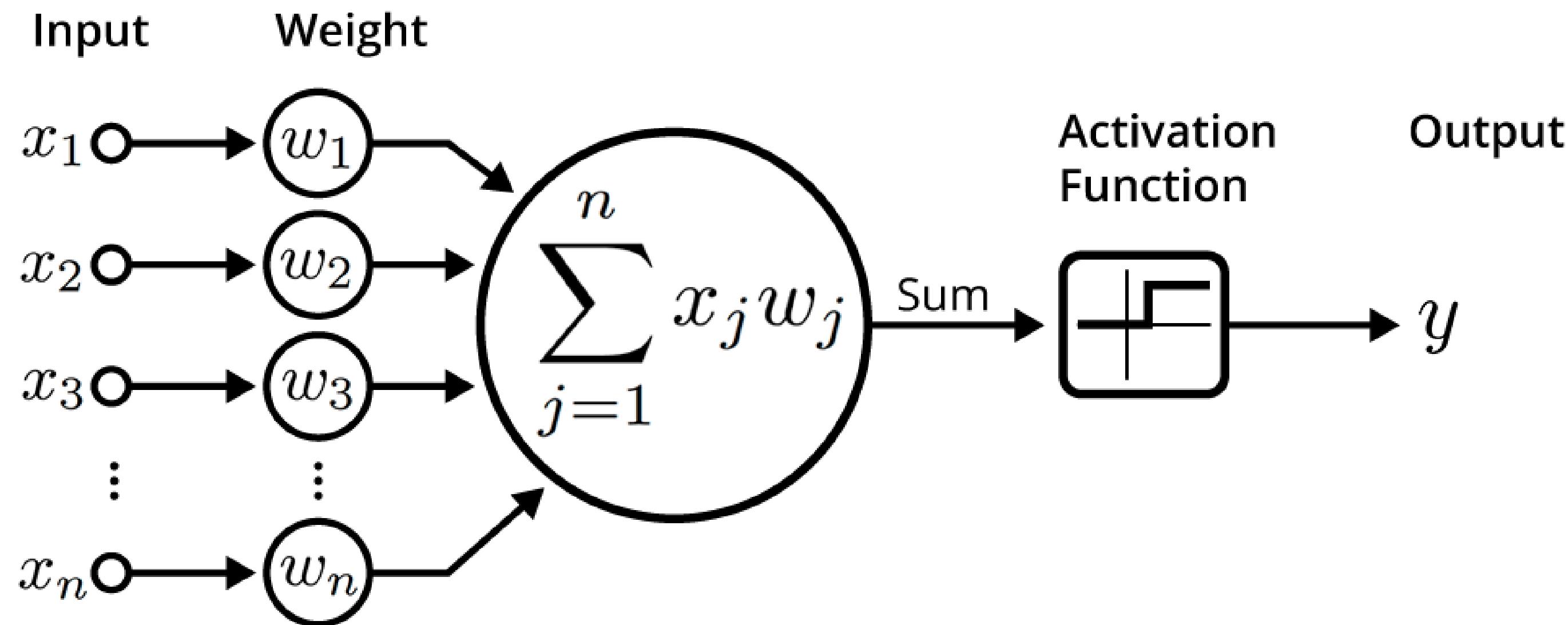
$$G(X) \approx Y \rightarrow f_2(g(x))$$

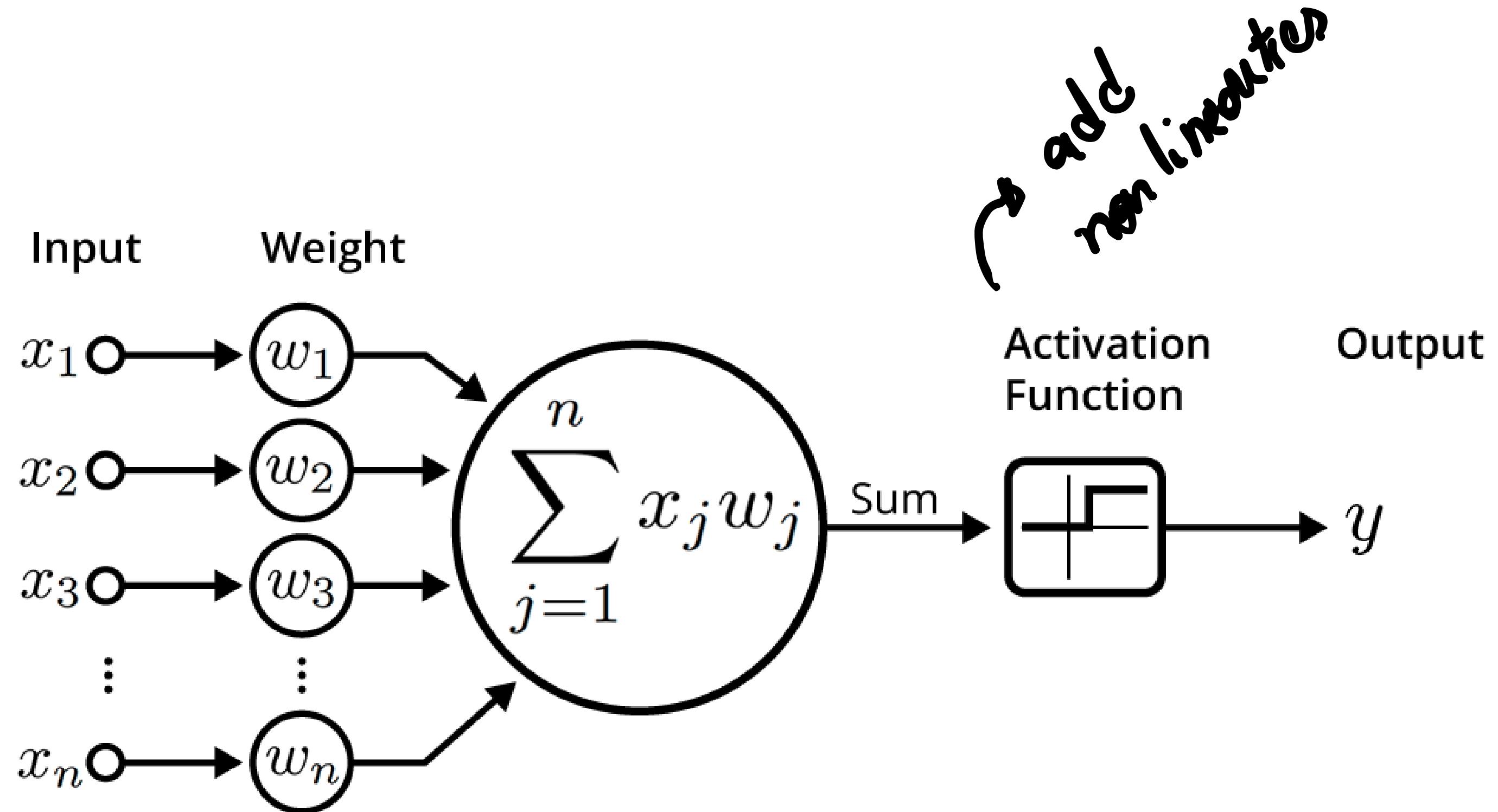
$$G(X) \approx Y \rightarrow f_2(g(x)) \rightarrow f_3(g_2)$$











$$\tilde{G}(X) \approx Y$$

Data

a way to compare your predictions to the
data

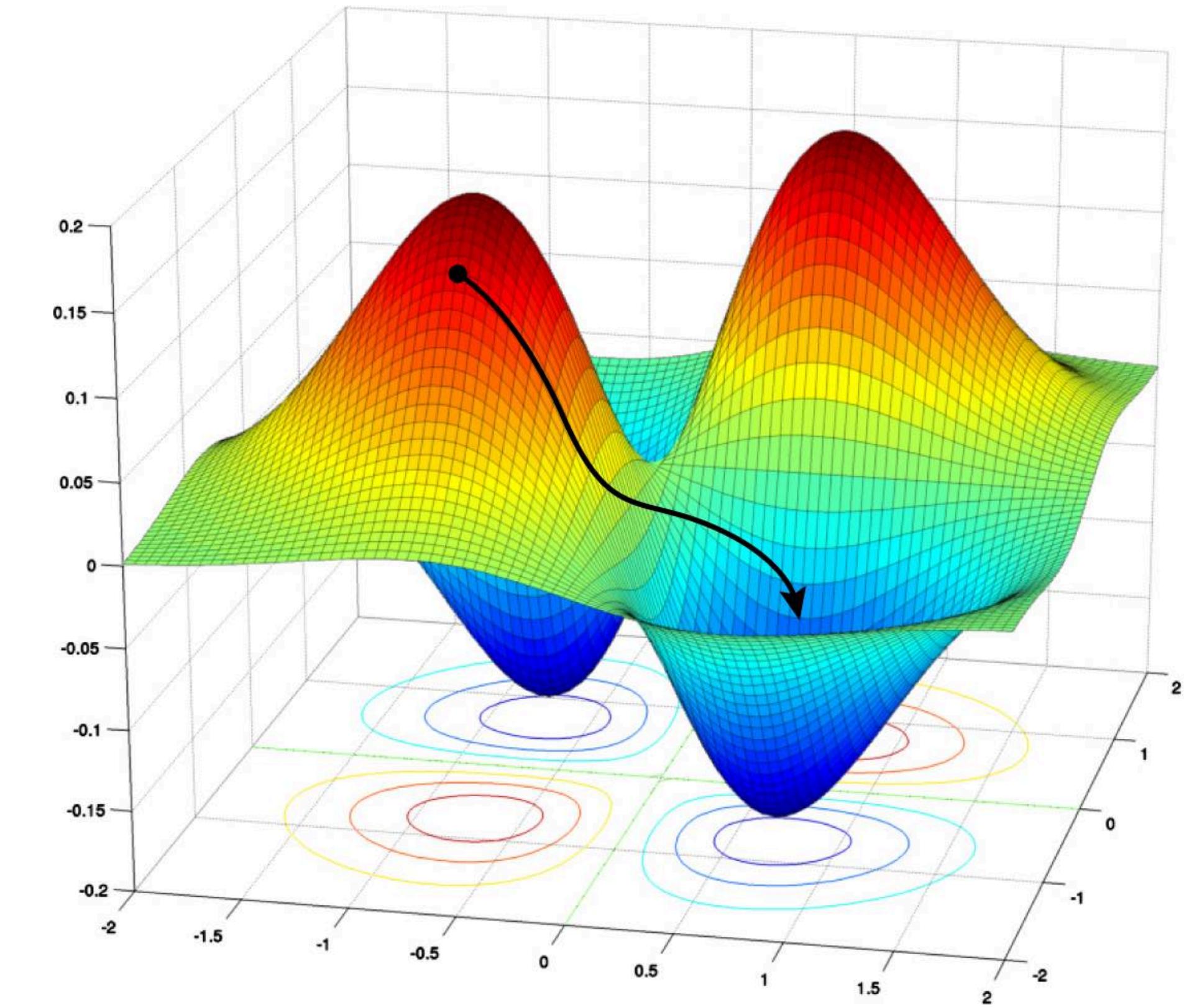
↳ loss function

+ a way to let
your model improve

GRADIENT DESCENT

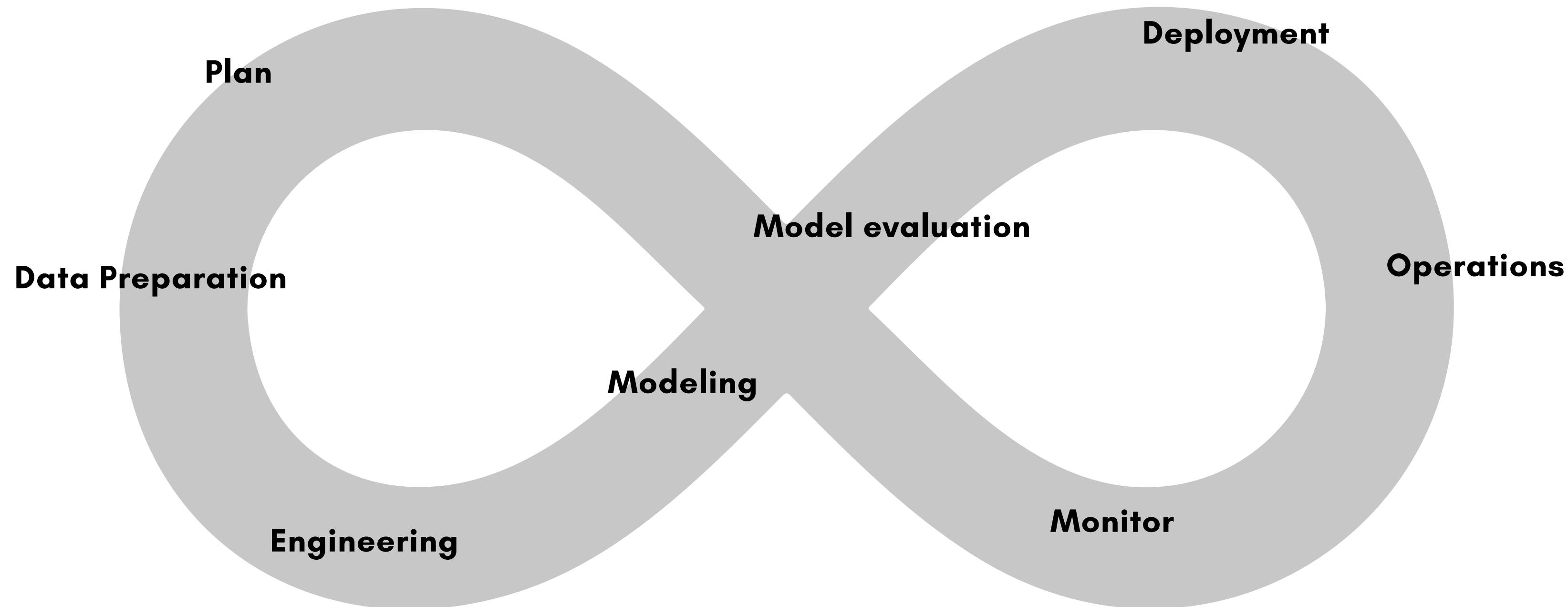


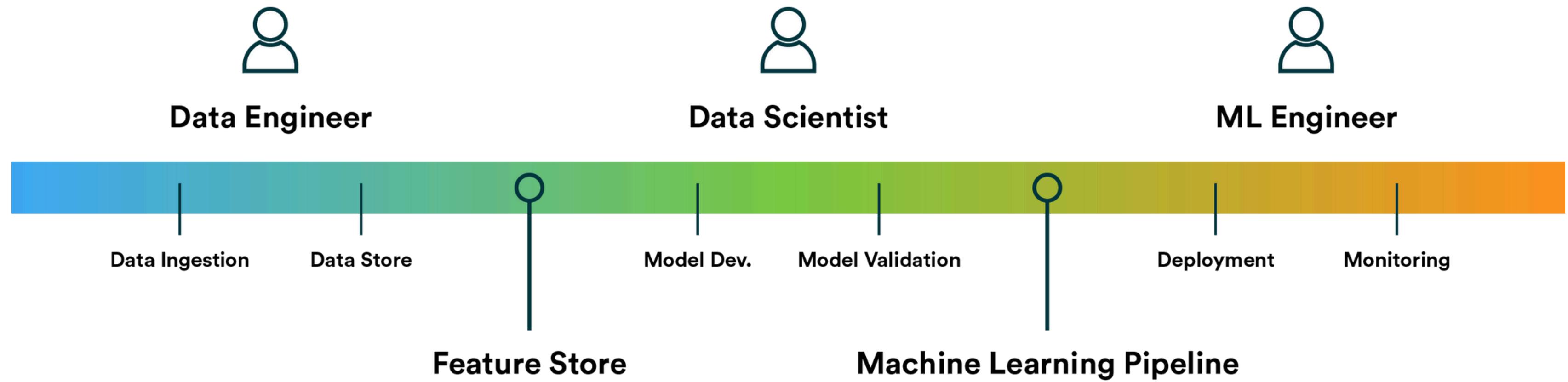
GRADIENT DESCENT

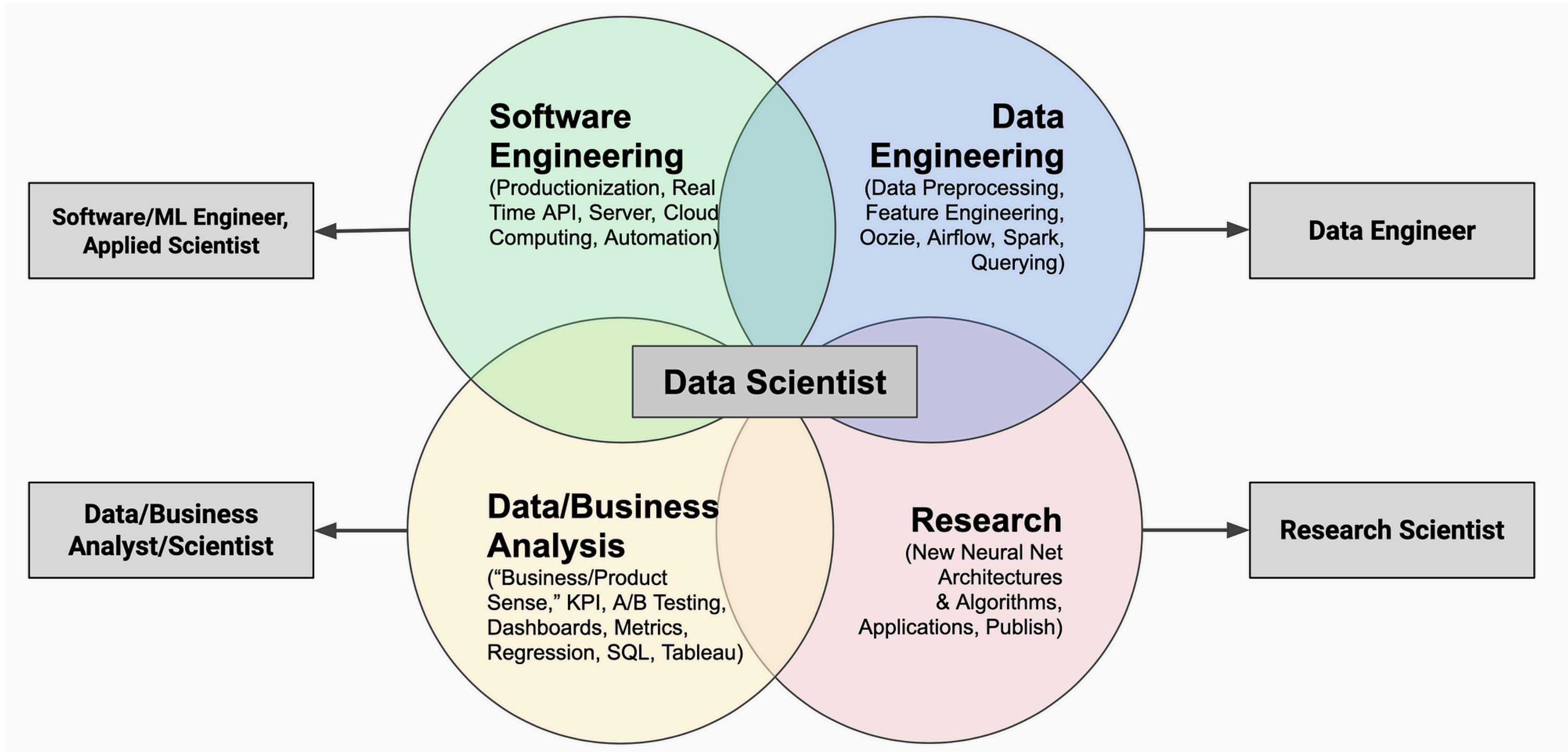


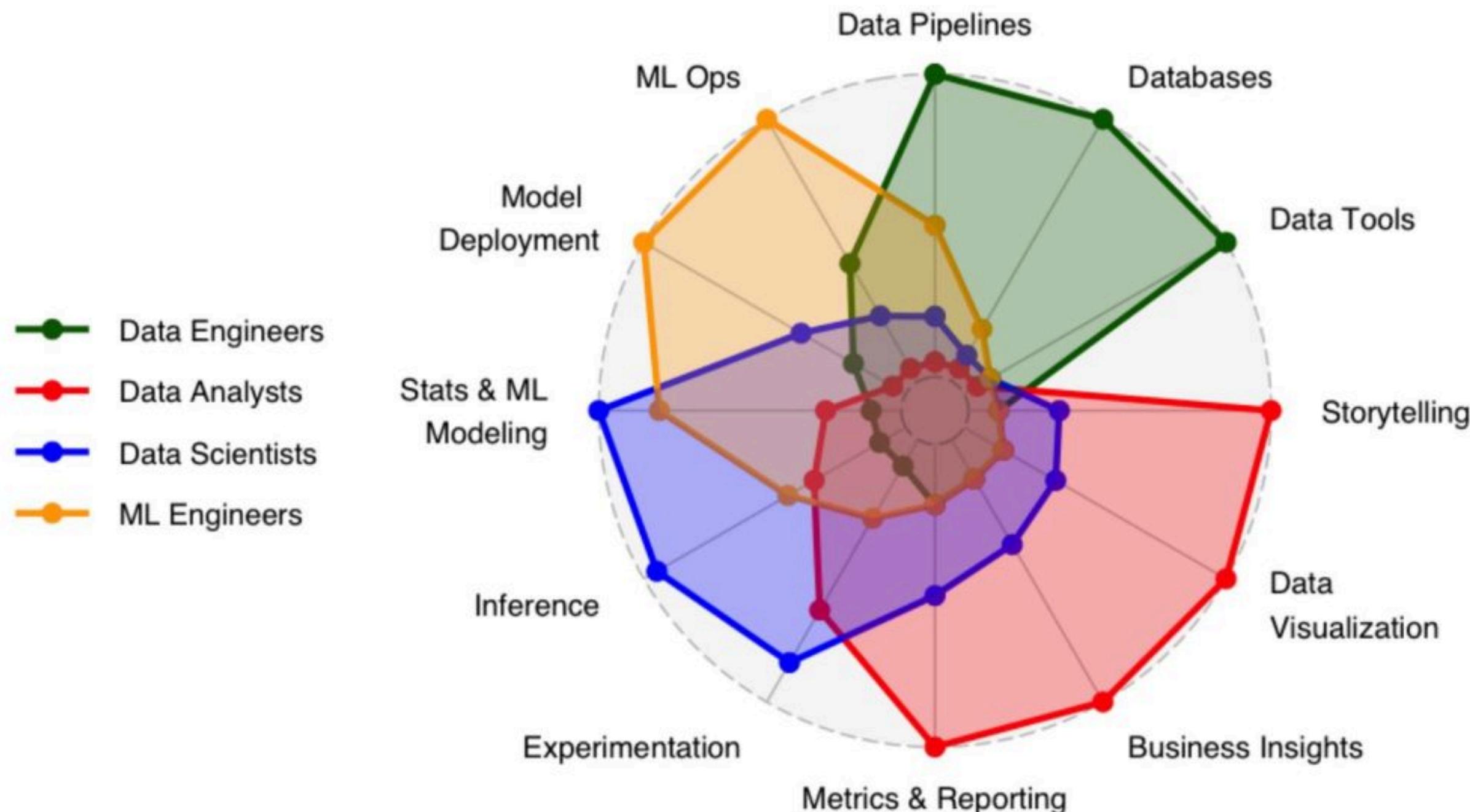
**SO,
WHAT IS
AI ENGINEERING?**

The AI Model's Journey









	Business Understanding	Data Understanding	Data Preparation	Modeling	Evaluation	Deployment
Data Scientist	Mid	High	Mid	Top	High	Lower
Data Engineer	Mid	High	Top	Lower	Lower	Mid
Data Analyst	Mid	Top	Mid	Mid	Lower	Lower
ML Engineer	Mid	Lower	Mid	Mid	High	Top

CREATING YOUR CHATBOT

LLM

LARGE LANGUAGE MODEL

LLM work by predicting the next token in a sentence

LLM

LLM work by predicting the next token in a sentence

One, two, three, ...

LLM

LLM work by predicting the next token in a sentence

One, two, three,

One, two, three, four

I

one, two, three,

Four, five, six.

Is there a particular counting sequence or pattern you'd like to continue? Or perhaps you're starting a list of some kind? I'd be happy to assist further if you provide more context or instructions about what you're trying to accomplish.

 Copy  Retry  



Claude can make mistakes. Please double-check responses.

I

one, two, three,

Four, five, six.

Is there a particular counting sequence or pattern you'd like to continue? Or perhaps you're starting a list of some kind? I'd be happy to assist further if you provide more context or instructions about what you're trying to accomplish.



one, two, three,



four, five, six,

◀ ▶ ⏪ ⏩ ⏴ ⏵

I one, two, three,

Four, five, six.

Is there a particular counting sequence or pattern you'd like to continue? Or perhaps you're starting a list of some kind? I'd be happy to assist further if you provide more context or instructions about what you're trying to accomplish.



one, two, three,



four, five, six,



I one, two, three,



Sure, here are the numbers:

1. One
2. Two
3. Three

I one, two, three,

Four, five, six.

Is there a particular counting sequence or pattern you'd like to continue? Or perhaps you're starting a list of some kind? I'd be happy to assist further if you provide more context or instructions about what you're trying to accomplish.



one, two, three,



four, five, six,



I one, two, three,



Sure, here are the numbers:

1. One
2. Two
3. Three

BUT NOT ALWAYS

$$G(X) \approx Y$$

LLM

Without a way to control text generation, LLM are not that useful

LLM

Without a way to control text generation, LLM are not that useful



My dog is in my room so I'm not going back home now I'm sorry

My dog is not mine and is not mine Took me to the man who is responsible After the drug reaches the door.

My dog is not the best thing for me

my dog attacks on me and I don't want to go out of town

My dog is not wired together yet but he is having a blast.

**LET'S
BUILD A BOT**

**HOW DOES THAT
WORK
ACTUALLY?**

**WHAT DID YOU
BUILD?**

A
TASTE OF
REAL LIFE

QUESTIONS?

THE BOOTCAMP EXPERIENCE

Full time

- **9 weeks**
- **4 projects + 2 mini projects**
- **Programming, Data Processing, Small ML, Deep Learning, NLP, Transformers and LLangChain**

Part time

- **24 weeks**
- **4 projects + 1 mini project**
- **Programming, Data Processing, Small ML, Deep Learning, NLP, Transformers and LLangChain**

THEORY

HANDS ON

HOW TO APPLY

Remote Artificial Engineering Bootcamp

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- 🚩 Remote - Live Classes in English
- ⌚ 9 weeks full time
- 🌐 Beginner-friendly, no previous experience required
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QUESTIONS?

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