

Sorry to bring us crashing back to earth, but do I seriously need some *freaky, calculus-filled energy landscape* just to price **TWENTY DUMB HOUSES** WITH ONE FEATURE EACH?

Nah.

No way!

SQUARE FEET **ACRES** **NEXT DOOR**

1 2,561 .225

2 2,675 .319

3 1,918 .505

4 3,442 1.76

5 2,206 1.24

6 3,117 .203

7 2,459 1.76

8 1,752 1.66

9 2,179 1.98

10 1,929 1.66

11 2,179 1.98

12 1,929 1.66

13 2,179 1.98

14 1,929 1.66

15 2,179 1.98

16 1,929 1.66

17 2,179 1.98

18 1,929 1.66

19 2,179 1.98

20 1,929 1.66

BUT what if there are **20 MILLION** houses with **200 features** each?!

YOW!

ROWW!

Okay, very impressive, but I gotta say... some of these features you've thrown in are a lot *less important* than others. I mean "size of garden gnomes"? C'mon.

Aha! So are you saying some features should carry *LESS WEIGHT* than others?

Sure, I— OH! They all have **KNOB**s now!

Perfect! Let's turn that feature *down*—

—and turn that one *up*, and...

...?

In ML, hypotheses flow *forward*, tuning parameters based on available data.

A *best guess* pops out—

H

Then that knowledge is propagated *back* through the system to help *re-tune* those parameters—

H

—and is confronted by the size and shape of its *error*.

Dude, you're, like, **THIS WRONG**:

—in hopes of making *better* guesses *next* time.

Ooh... Getting *closer*...

So, is machine learning mostly *classification* and *regression* like in our fork and house examples?

Yes and no. Those are useful *ingredients* in many machine learning recipes...

But at the end of the day, it's your choice of **LEARNING METHOD** that counts the *most*.

And these days, there are **THREE** *methods* most commonly used in machine learning tasks.

Which you choose depends on what you want out of your data.

In **supervised learning**, the ML model trains on sets of labeled *training data*, then *guesses* at the labels of subsequent *testing* datasets, often in multiple iterations—

—until it's ready to deploy on that *final* dataset called the **WORLD**.

HA HA! So **THAT'S** what a hedgehog looks like!

In **UNSUPERVISED** there's no "right" answer per se. You're on the lookout for clusters or anomalies that may turn out to be meaningful.

Such as people who like the same type of movies.

OMG I love that one!

SO GOOD!

Have you seen *that* one though?

And in **REINFORCEMENT LEARNING**—

—the program tries to find the most efficient pathway to its goal.

Successful routes get a reward.

Failures, a restart.

SUPERVISED LEARNING **UNSUPERVISED LEARNING** **REINFORCEMENT LEARNING**

These categories don't account for **ALL** of machine learning, but they cover a lot of ground.

So self-playing arcade games are cool and all—

—but I want to hear more about *practical* applications. What can this stuff be used for in the *real world*?