M 15 Using probability for ~~AI~~ ML

AI is a fictional technology that does not exist

↳ Machine Learning

Wisconsin Breast Cancer Data

↳ Large number of variables from ultrasounds of breast tumors Patient data

Predict?

Who has breast cancer and who has benign tumors.

As a statistician

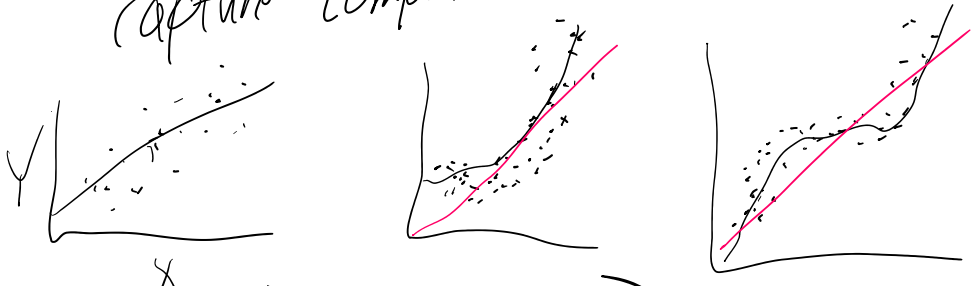
Find which variables best predict breast cancer diagnosis, construct a model that allows us to asses how each of these variables impacts breast cancer prediction

What if we don't care about the why?

What if all we care about P(BC|Data) that is as accurate as possible?

Machine Learning

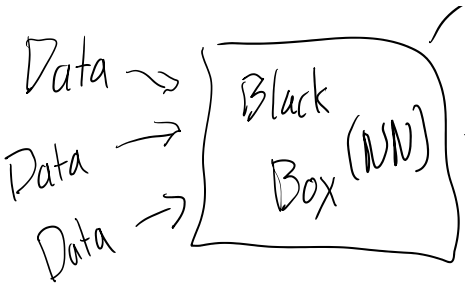
Machine Learning techniques often function as a black box, but capture complex trends in data



Data → Black Box → output

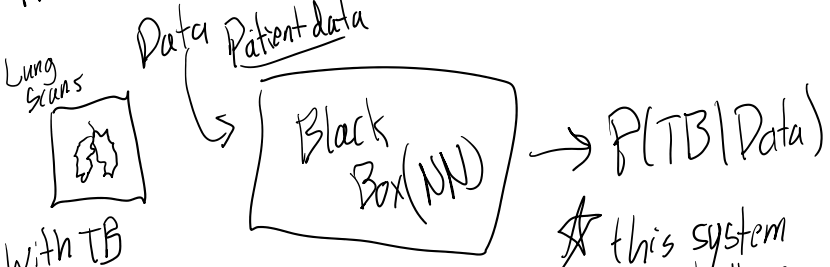
Data → Black

The black box can capture any trends as long as it

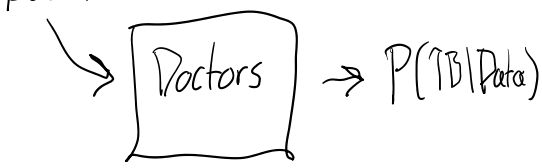


capture any trends as long as it has enough data and is big enough.

This was done for a Tuberculosis diagnosis system



★ this system is better



AB testing

We take identical data

A:

B:

Patient data

A: 50yo → 15% TB

B: 35yo → 12% TB

Scans from older machines were producing higher incidence rate of TB.

There was a bias in the data the algorithm picked up

ML algorithms pick up patterns and trends exist in the data regardless of if they are spurious, unintended, bad.

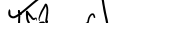
What if we took recidivism data and tried to predict reoffense?

who goes back to jail

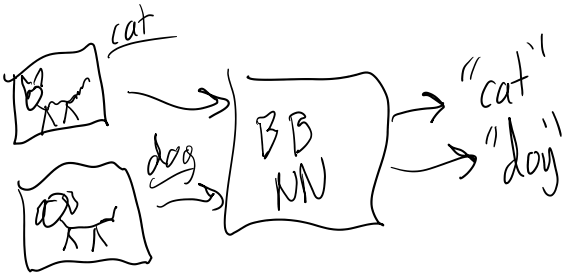
American criminal justice system is rife with racial bias.

ML models trained on this data capture and propigate this bias.

Generative "AI"

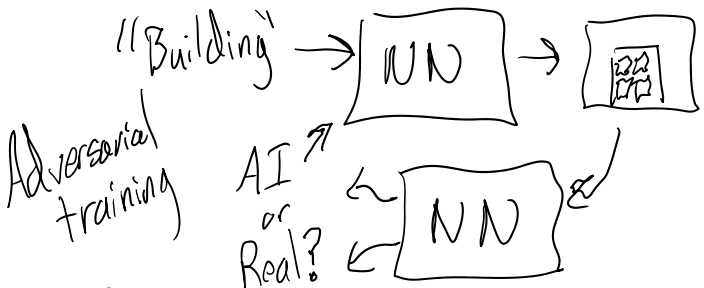


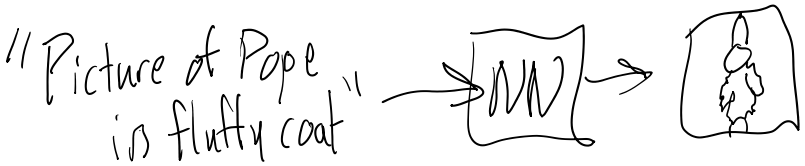
Training this requires a lot of labeled pictures of cats and cars and buildings



of labeled pictures of cats and dogs and cars and buildings

Generative Neural Network

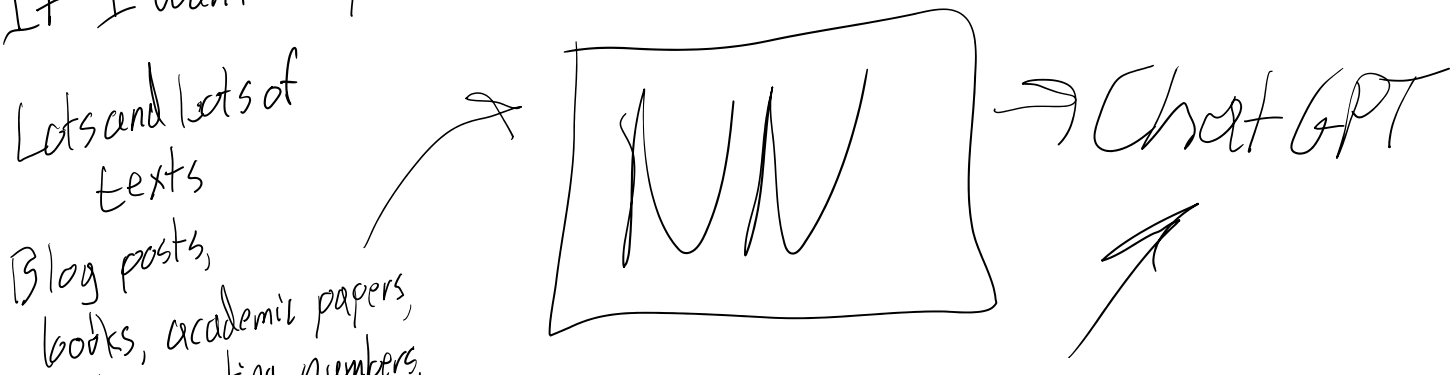




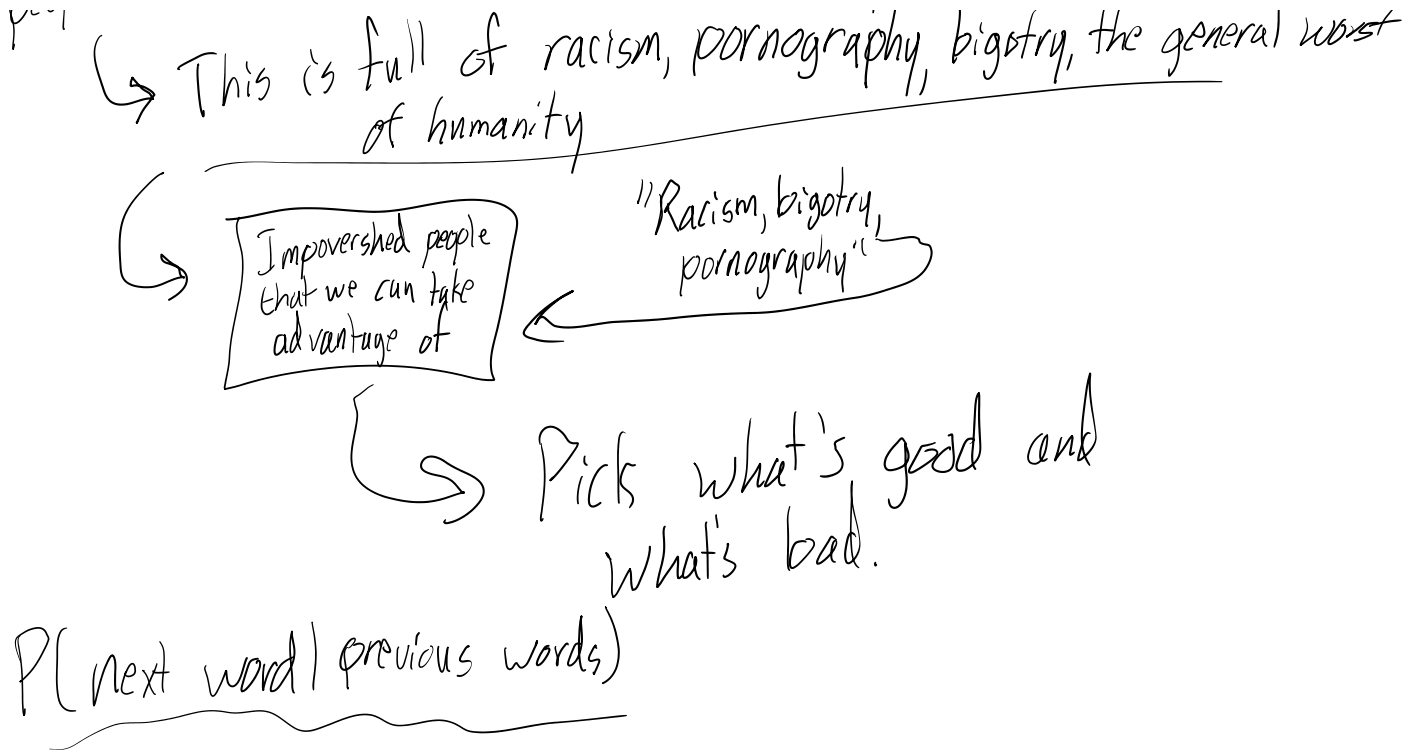
What if there existed a dataset bigger than any other One that was self labeling?

"I went to Berlin when I was younger and we saw what remained of the Berlin wall."

If I want to predict the next word given all previous words.



↳ This is full of racism, pornography, bigotry, the general worst



P(next word | previous words)