# Pipeline of Machine Learning

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# Outline

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# Steps in an ML Project

## Project Pipeline

0. Define the problem.
1. Collect data.
2. Design the features in the data.
3. Training of the model.
4. Test the model.

# Discussion on the ML Project Pipeline

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2. Design the features in the data.
    - Not one thing that you always do here. Sometimes use experience/knowledge of what the data represents, sometimes use another learning algorithm to *learn* good features.

# Discussion on the ML Project Pipeline

3. Training of the model.
    - Model is determined by set of parameters. In training, you alter the parameters iteratively – “tune” them – using optimization techniques (on the loss function).
4. Test the model.
    - Evaluate the trained model’s performance on test data, measured by the same loss function.

# Poll question

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> Example. Have database of Tweets (from X / Twitter) about news events; interested in using machine learning to determine which are giving misinformation.
> Is it a simple classification problem, `'misinformation'` vs. `'not'`? If not, what alternative is there?

Sometimes the issue is in the data.

> Example. Attempting to use crime data in Baltimore to model how crimes occur by location (*e.g.*, reoccurrence of crime at same location shortly after).

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Example. In textbook, reconstructed Galileo experiment for objects falling.

$$\text{Force of gravity is constant } (g)$$
$$\Downarrow$$
$$\text{height change is } \frac{g}{2}t^2 \text{ (from Calculus)}$$

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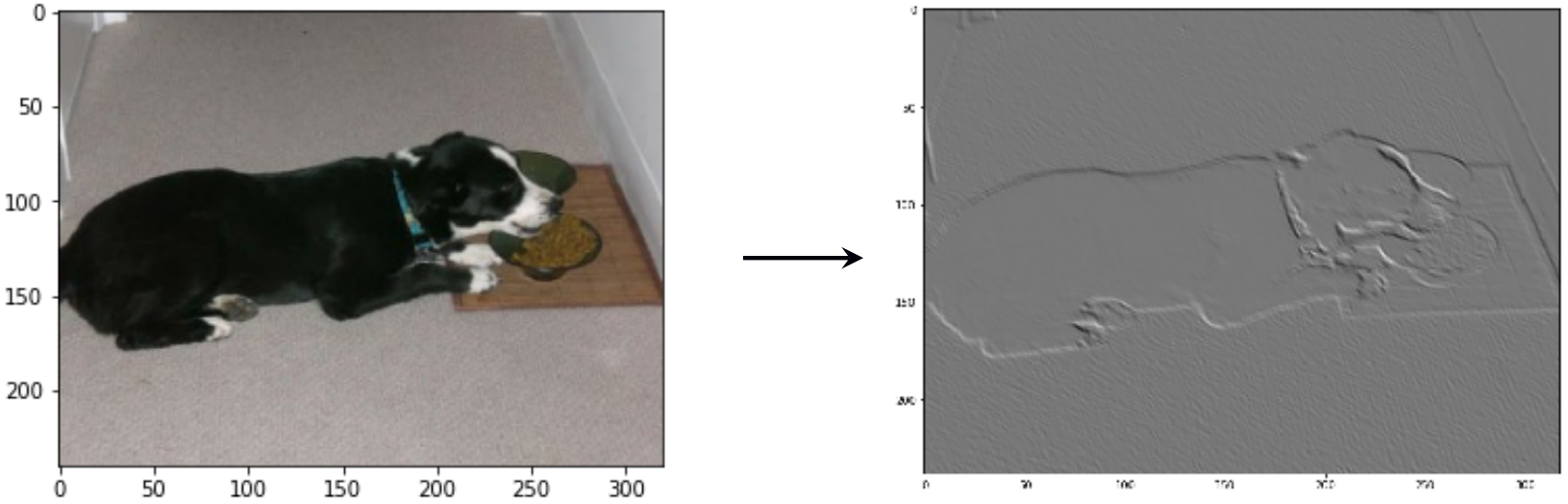

# Questions?