

Week 2 continued..

What is AI policy?

### Regulations

Regulations do not have a relationship w. innovation.  
It is empirically false.

But the belief that regulations are inversely proportional to innovation leads to bad policy making, i.e. a lack of policy making.

Countries w. a lack of scholarship in policy do not have any regulations in IT, data, tech..

No IT companies come under MSME.

IT employees ~~don't~~ are not covered in the labour laws.

What passes for innovation is really exploitation.

Rate of people being hired in the digital sector has sharply declined. ↓  
People are being hired to replace former employees.

" The Curious Case of the Google Ethics Council "

Digital sector has a ~~potential~~ large potential cause harm.

So much power given to so few companies caused paranoia.  
Led to the need for IT companies / digital sector companies being regulated ~~in~~.

Regulation = Self regulation ( "Do no harm" )

Any products by Google ~~has~~ have to pass through severe checks by the Google Ethics Council.

~~Google employees~~ The entire ethics council was fired!

Companies are fundamentally incapable of self governance.

The aim of any company is to increase shareholder value.

They are legally bound to do so.

There are 2 ways to maximise profits = exploit  
innovate

Exploitation is a mathematical choice as opposed to a moral choice.

Innovation has an upper limit.

In the AI Sector companies are self regulating.

Microsoft came under fire for selling their AI products to border security forces.

"Ethics Washing"

Techno Solutionism and Reification

Personhood and exploitation are not solved by trying to rush through them w. technology.

Societal problems (structural issues) cannot be replaced w. an accelerant. Technology does not change the original scenario.

Power is not changed by technology, only velocity is.

Ergen Morosov

"False reality"

Making categories and making them into reality is reification.

The entire field of machine learning has the problem of reification.

Circular logic.

Categories are created, competitions are happening in those categories, and new solutions are termed as state of the art.

We should not conflate reification w. scientific, objective truths.

AI as the Scapegoat

The entire field on AI is a technology; the decision to use or not use the technology is policy.

"Copystrike"

→ happens through an automated mechanism.

A simple machine learning algorithm.

People are often wrongly copystruck.

The decision to use this code comes from the realization that to have people do this work, companies have to spend money.

The decision to use this code is a human, corporate or political decision.

AI does not have ~~the~~ agency to cause those problems.

~~It has~~ Every tool ~~has~~ has its interest gradient, eg. AI is stochastic in nature.

The decision to use this tech is not a neutral / automatic decision.

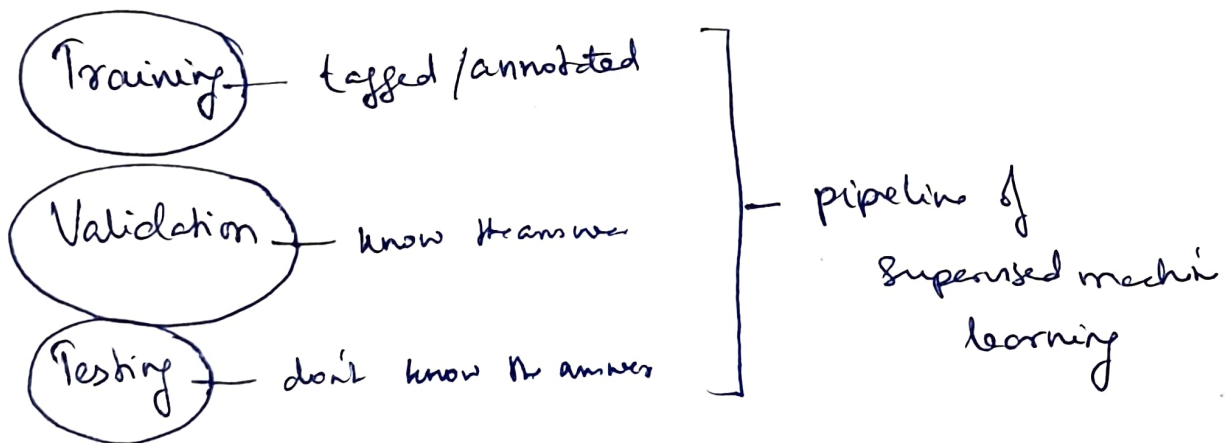
The problem that arises can not be blamed on the features of the tech, humans need to be held accountable.

Week 3...

## Introduction to Machine Learning

What is machine learning?

Algorithms that improve automatically through experience by using data.



**features** — the attributes that are being identified.  
Useful qualities extracted from the data point.

image feature answer

For every feature, one dimension is added.

For  $n$  features, we are working in an  $n$  dimensional space.

"curse of dimensionality".

Finding the useful dimensions ~~is~~ is called dimensionality reduction.

PCA (Principal Component ~~Analysis~~ Analysis)

Google Colab

# Jargon

- Cross Validation

Validation process is problematic; could just be a statistical outlier because of the small size of the ~~data~~ data set.  
It can be made more robust ~~by~~ by validating it many times over.  
Breaking the training data and using it to repeatedly validate.

- Active Learning

Is retraining w. all data everytime logical? No!

See where the error is ~~error~~ showing.

In every step of the iteration, we see when the ~~machine learning~~ <sup>model</sup> fails and use those data points to retrain.

- Ensemble learning

Taking a bunch of models & joining them

- Oracle:

Creates synthetic test use cases.

- Overfitting:

Data points in the training set are so similar to each other the model has a very narrow scope of vision. It is called a brittle model. It is easy to break w. an anomalous data point.

- Explainability

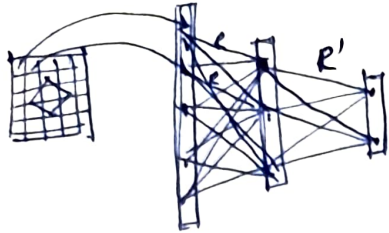
Can give an explanation about the results it shows.

- Bias

A feature which should be relevant to the answer is irrelevant.



A neural network has an input layer and an output layer.



Each edge has a weight (random number)

Errors flatten out.

Back propagation - signal of the error goes backward to change the error of each of the edges.

## Convolutional process

Simple neural network - perceptron

Multiple layers - ~~percept~~ deep neural network