

18/10/24

PS-643

→ we have talked about how computer vision came into history.

→ people are working in computer vision areas from 1950's

→ Imagenet is largest dataset.

→ Imagenet has existed as a project for almost a decade.

There are more than 40 million images on Imagenet.

→ Flickr has lot's of images as well. You can upload your images on flicker.

→ Imagenet has more than 91 thousand labels of these images.

⊛ What is Deep learning ⇒ how a basic NN work?
you have a bunch of i/p nodes, hidden nodes and some output nodes. All these nodes are connected by edges. Each edges has weights.



Error is difference between the generated o/p and the output should come is defined by some formula. It works as loss and we update the weights based on loss. It keeps going till the loss doesn't decrease any more. That's how a neural network works.

⊛ You can't have a neural network without 1 hidden layer if you want to do some nonlinear operations. All layers are fully connected. It is called Fully Connected layer.

→ When you have lot's of neural networks and are not fully connected. It is deep neural network.

- In the earlier time when we do image processing what we do is extract the features from the image.
- softmax layer converts the output into a fully connected layer.
- All these layers are the feature learning layer.

(*) What does convolution, Relu & pooling layer does? convolution do work same as kenny edge detection. (with only minor difference). A layer has a window and it does work on data & do convolution.

Relu layer is a very simple layer. It is a floor type of function

$$\text{Relu}(x) = \begin{cases} x & , x \geq 0 \\ 0 & , \text{o.w.} \end{cases}$$

(*) Pooling layer: pooling layer is a zoom in ~~can~~ kind of thing. (Max Pool it is). In a feature set it takes the max value & discard others.

- ⇒ In 2016 the idea of automated cars was very popular. If you are working in computer vision in the next 3 years you can make money. No machine learning can predict future. Even if you have 99.9999% accuracy you have to interact with cars.
- ⇒ Automated car is not a real thing but it is cool.
- ⇒ Policy ⇒ why do you want automated car? Real reason you don't want to drive. ~~Most~~
- Most of the people in the world don't have money to afford a car even automated cars
- We need roads because we want to travel from point A to B.
- From a public policy point of view there should not be any cars in the world. Only trains or buses should exist.

- People bugs cars because of ego.
- There are cities in Europe where inside the cities cars are banned completely.
- If you don't want accident then don't by cars. If you see state then even Indian trains are more safe then cars.
- Cars are luxury that harms planet in many ways.

⊛ In 2000's it used to happen that ~~scientist~~ scientist uses or download images from Flickr like platforms and use for their purpose. Nobody think of privacy problem or copyright issue. That data is used to platform that makes facial recognition tools. Which is wrong. Computer vision relies on unpaid datasets with free labour of humans.

→ Humans are very good at reading comics compared to computer vision.

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