Mar 7, 2019 Neural Networks

CMPE297 Video Analytics.

Reference: 1° github/khalili/cmpe297/2019S/

2019S-3U~. 2° ~2019S-292018~.

3°~2019S-29~(3 jpg Handwritten

4° 1.jpg, 2.jpg. Notes)

3.jpg.

MNIST

Py Sample code.

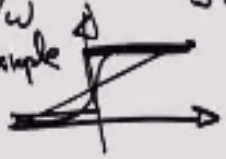
Example: DNN (Dense Neural Networks)

(1) Architecture for DNN (2) Math. Formulation

$$f(\vec{x}) = \begin{cases} 1 & \sum \omega_i x_i + b \geq \text{Threshold} \\ 0 & \text{o/w} \end{cases}$$

Step function

(3) ~~Actual~~ Simple Example in 2D Case.

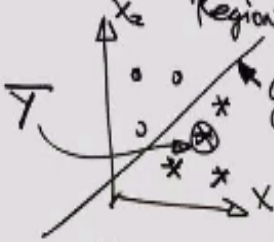


To Design a NN model to Detect One of the 2 Signs

$$\frac{\iint_{\Omega} (x-\bar{x})^i (y-\bar{y})^j E(x,y)\,dx\,dy}{\iint_{\Omega} E(x,y)\,dx\,dy}$$

Step 1. Train NN. Step 2. Deploy the NN.

Visualization for the Training; Deep Learning ⇒ Machine Learning + C.V.



Region CI: "Stop" Signs. $X_{11}, X_{12}, \cdots, X_{1N}$

" CII: "Right" Class I (Region I) $X_{21}, X_{22}, \cdots, X_{2M}$

X_{pq}, p: Class p=1,2; q: No. of Samples, q=1,2,...,N

$f(\vec{x}) > 0$ Above the Line, Class I; $f(\vec{x}) < 0$ for Region II

Mar 7, 2019 Formulation for Point Cloud