



ChatGPT

The discriminative function $f(x_i)$ of a neural network parameterized by a set of weights θ typically consists of the mapping from the input x_i to the output of the c -class softmax layer. In the context of a neural network for classification, this involves applying linear transformations followed by a softmax activation.

The formula for $f(x_i)$ can be expressed as:

$$f(x_i) = \text{softmax}(W \cdot x_i + b)$$

Here:

- x_i is the input to the neural network (features of the data point i),
- W is the weight matrix,
- b is the bias vector,
- `softmax` is the softmax activation function.

The softmax activation is applied element-wise to the vector $W \cdot x_i + b$, and it normalizes the values into probabilities. The output of $f(x_i)$ is a probability distribution over the c classes.

The softmax function is defined as:

$$\text{softmax}(z)_i = \frac{e^{z_i}}{\sum_{j=1}^c e^{z_j}}$$

Here, z is the vector obtained from the linear transformation $W \cdot x_i + b$, and $\text{softmax}(z)_i$ represents the i -th element of the resulting probability distribution.

In summary, the discriminative function $f(x_i)$ takes the input x_i , applies linear transformations with weights W and biases b , and then applies the softmax activation to produce a probability distribution over the c classes.



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