

Deep Learning - Theory and Practice

Basics of Machine Learning

18-01-2018

<http://leap.ee.iisc.ac.in/sriram/teaching/DL18/>

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Recap ...

- ❖ Decision Theory
 - ❖ Inference problem
 - ❖ Finding the joint density $p(\mathbf{x}, \mathbf{t})$
 - ❖ Decision problem
 - ❖ Using the inference to make the classification or regression decision

Decision Problem - Classification

- ❖ Minimizing the mis-classification error
- ❖ Decision based on maximum posteriors

$$\mathit{argmax}_j p(C_j|\mathbf{x})$$

- ❖ Loss matrix
 - ❖ Can be used for non uniform error weighting.

Approaches for Inference and Decision

I. Finding the joint density from the data.

$$p(C_k|\mathbf{x}) \propto p(\mathbf{x}|C_k)p(C_k)$$

II. Finding the posteriors directly.

Neural Networks

III. Using discriminant functions for classification.