

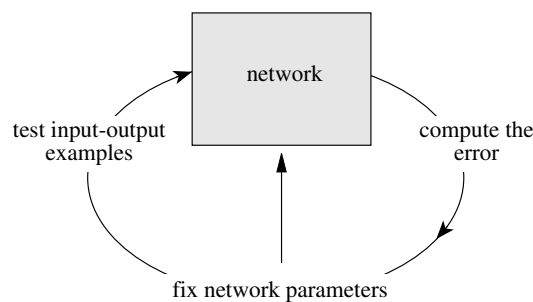
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## Perceptron Learning

### 4.1 Learning algorithms for neural networks

In the two preceding chapters we discussed two closely related models, McCulloch–Pitts units and perceptrons, but the question of how to find the parameters adequate for a given task was left open. If two sets of points have to be separated linearly with a perceptron, adequate weights for the computing unit must be found. The operators that we used in the preceding chapter, for example for edge detection, used hand customized weights. Now we would like to find those parameters automatically. The *perceptron learning algorithm* deals with this problem.

A learning algorithm is an adaptive method by which a network of computing units self-organizes to implement the desired behavior. This is done in some learning algorithms by presenting some examples of the desired input-output mapping to the network. A correction step is executed iteratively until the network learns to produce the desired response. The learning algorithm is a closed loop of presentation of examples and of corrections to the network parameters, as shown in Figure 4.1.



**Fig. 4.1.** Learning process in a parametric system

















































