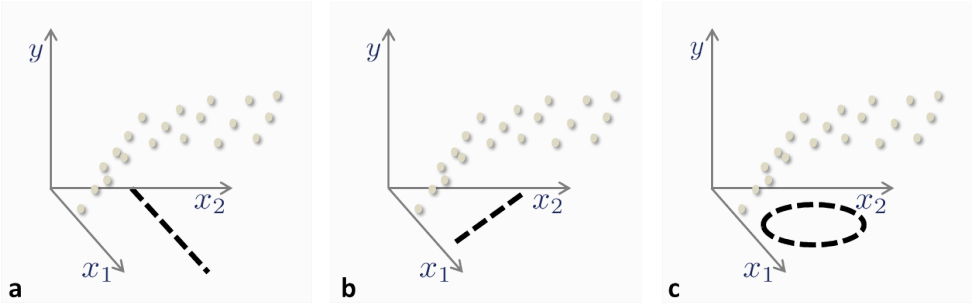

Fig. 4.5: **Example weak learners.** The (x_1, x_2) plane represents the $d-$dimensional input domain (independent). The y space represents the $n-$dimensional continuous output (dependent). The example types of weak learner are like in classification **(a)** Axis-aligned hyperplane. **(b)** General oriented hyperplane. **(c)** Quadratic (corresponding to a conic section in 2D). Further weak learners may be considered.

work in practice and the effect of different model choices on their output.

4.3 Effect of model parameters

This section discusses the effect of model choices such as: tree depth, forest size and weak learner model on the forest behaviour.

4.3.1 The effect of the forest size

Figure 4.6 shows a first, simple example. We are given the training points shown in fig. 4.6a. We can think of those as being randomly drawn from two segments with different orientations. Each point has a 1-dimensional input feature x and a corresponding scalar, continuous output label y.

A forest of shallow trees ($D = 2$) and varying size T is trained on those points. We use axis-aligned weak learners, and probabilistic-linear predictor models. The trained trees (fig. 4.6b) are all slightly different from each other as they produce different leaf models (fig. 4.6b). During training, as expected each leaf model produces smaller uncertainty near