



Figure 15.8: Illustration of how the nearest neighbor algorithm breaks up the input space into different regions. The nearest neighbor algorithm provides an example of a learning algorithm based on a non-distributed representation. Different non-distributed algorithms may have different geometry, but they typically break the input space into regions, *with a separate set of parameters for each region*. The advantage of a non-distributed approach is that, given enough parameters, it can fit the training set without solving a difficult optimization algorithm, because it is straightforward to choose a different output *independently* for each region. The disadvantage is that such non-distributed models generalize only locally via the smoothness prior, making it difficult to learn a complicated function with more peaks and troughs than the available number of examples. Contrast this with a distributed representation, figure [15.7](#).