

# 11

## Neural Networks

### 11.1 Introduction

In this chapter we describe a class of learning methods that was developed separately in different fields—statistics and artificial intelligence—based on essentially identical models. The central idea is to extract linear combinations of the inputs as derived features, and then model the target as a nonlinear function of these features. The result is a powerful learning method, with widespread applications in many fields. We first discuss the projection pursuit model, which evolved in the domain of semiparametric statistics and smoothing. The rest of the chapter is devoted to neural network models.