how the eyes move (p. 49). The stimulus is typically manipulated during a saccade when visual intake is significantly impaired. To maximize the time available for such a computationally costly stimulus manipulation, it is important to quickly and accurately detect the offset and, in particular, the onset of a saccade. In this case a high sampling frequency is very desirable.

2.6.2 Accuracy and precision

While the *accuracy* of an eye-tracker is the (average) difference between the true gaze position and the recorded gaze position, *precision* is defined as the ability of the eye-tracker to reliably reproduce a measurement. The difference between accuracy and precision is illustrated in Figure 2.13. Obviously, a good eye-tracker should have both high accuracy and high precision. Beware that these two properties of eye-trackers are often confused.

This section only deals with *spatial* precision. There is also *temporal* precision, which we describe on page 43.

Other much-used eye-tracking concepts that draw on the definition of accuracy and precision include:

Offset Formally, angular distance between calculated fixation location and the location of the intended fixation target, i.e. an operational definition of accuracy. Informally, an acceptable precision in combination with a poor accuracy, examplified in the left part of Figure 2.13.

Drift A gradually increasing offset, common in older eye-trackers.

System-inherent noise Best possible precision you can get with a given eye-tracker, also known as *spatial resolution*. This is typically measured with artificial eyes, which are absolutely still, so we know for certain that spatial variance comes from the eye-tracker itself.

Oculomotor noise Traditionally refers to the fixational eye movements tremor, microsaccades, and drift, even though microsaccades have been linked to cognitive functions (Martinez-Conde *et al.*, 2009). Oculomotor noise is often called *jitter* (Martinez-Conde *et al.*, 2004; Jacob, 1991).