Errata

Page 89 , Equation 6.42 and 6.43 $P(\neg e)$ should be $P(e)$ in the first part and in later in calculation 0.01 should be 0.001:

$$P(A|b,e,j,m) =$$
$$\alpha \cdot \sum_b (P(A|b,e) \cdot P(b) \cdot P(e) + P(A|b,\neg e) \cdot P(b) \cdot P(\neg e)) \tag{1}$$

$$P(A|b,e,j,m) = \alpha \cdot (P(A|b,e) \cdot P(b) \cdot P(e) + P(A|b,\neg e) \cdot P(b) \cdot P(\neg e) +$$
$$+ P(A|\neg b,e) \cdot P(\neg b) \cdot P(e) + P(A|\neg b,\neg e) \cdot P(\neg b) \cdot P(\neg e)) \tag{2}$$

with the values from conditional probability table

$$P(a|b,e,j,m) = \alpha(0.95 \cdot 0.001 \cdot 0.002 + 0.94 \cdot 0.001 \cdot 0.998 +$$
$$0.29 \cdot 0.999 \cdot 0.002 + 0.001 \cdot 0.999 \cdot 0.998)$$

and

$$P(\neg a|b,e,j,m) = \alpha(0.05 \cdot 0.001 \cdot 0.002 + 0.06 \cdot 0.001 \cdot 0.998 +$$
$$0.71 \cdot 0.999 \cdot 0.002 + 0.999 \cdot 0.999 \cdot 0.998),$$
$$P(a|b,e,j,m) = \alpha \cdot 0.00245756, \quad P(\neg a|b,e,j,m) = alpha \cdot 0.997424 \tag{3}$$
$$\alpha = \frac{1}{0.00245756 + 0.997424}. \tag{4}$$

The probability of $Alarm$ being present or not is

$$P(a|b,e,j,m) = 0.00245756, \quad P(\neg a|b,e,j,m) = 0.997424. \tag{5}$$

Terminology (page 109): In quantum physics a pure quantum state is a state which can be described by a single ket vector. A mixed quantum state is a ensemble of pure states. A mixed state cannot be described by a ket vector, it is described by the corresponding density matrix. An ensemble is a probability distribution for the state (several ket vectors). In the book we do not work with mixed quantum states, only with states that can be represented by ket vectors.

- Instead of the name eigenstate (basis state), the name pure state is used through the book (see page 109, "States equal to a basis are called pure states.")

  Page 6, 109, 120, 122, 123, 132, 136, 160, 161, 171, 176, 261 Replace *pure state* by *eigenstate*.

- The von Neumann entropy distinguishes between states that can be represented by ket vectors or not. For a state that can be represented by a ket vector the von Neumann Entropy is zero, otherwise it is bigger. In the book we are using the Shannon entropy that describes the distribution of the ket vector as defined by the Equation 7.50, page 109 and not the von Neumann entropy. It describes the departure of the state from a basis state with a maximal value for superposition when all corresponding probability values $\|\omega_i\|^2$ are equal.

  Page 109, 129, 130, 135, 161, 176 Replace *von Neumann entropy* by *entropy*.