The calculations in the slide "Distance between segments" are slightly wrong because they assume the vectors u and v to be unit vectors ($u \cdot u = 1; v \cdot v = 1$), which is not normally the case.

The correct generic equations are:

$$\|d\|^2 = (d_0 \cdot d_0) + s^2(u \cdot u) + t^2(v \cdot v) + 2s(d_0 \cdot u) - 2t(d_0 \cdot v) - 2st(u \cdot v)$$

$$\frac{\partial(\|d\|^2)}{\partial s} = 2s(u \cdot u) + 2(d_0 \cdot u) - 2t(u \cdot v) = 0$$

$$\frac{\partial(\|d\|^2)}{\partial t} = 2t(v \cdot v) - 2(d_0 \cdot v) - 2s(u \cdot v) = 0$$

$$s_{min} = \frac{(d_0 \cdot v)(u \cdot v) - (d_0 \cdot u)(v \cdot v)}{(u \cdot u)(v \cdot v) - (u \cdot v)^2}$$

$$t_{min} = \frac{(d_0 \cdot v)(u \cdot u) - (d_0 \cdot u)(u \cdot v)}{(u \cdot u)(v \cdot v) - (u \cdot v)^2}$$

The general condition to check if the two segments are parallel is:

$$(u \cdot u)(v \cdot v) - (u \cdot v)^2 = 0$$