ex01_Q5: Spike-train Convolution
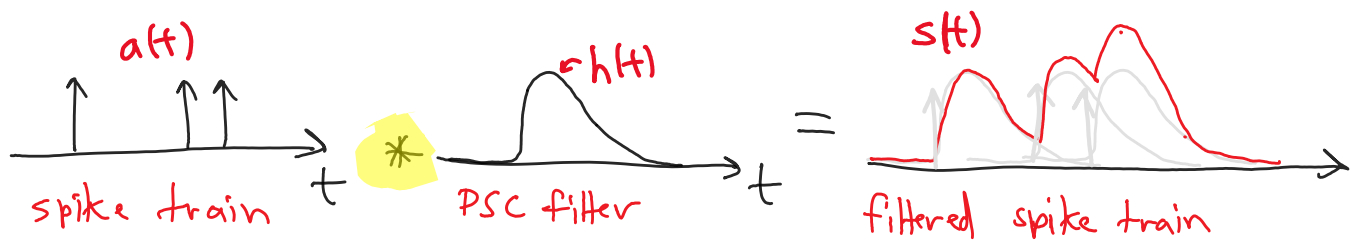
$$s(t) = (a * h)(t)$$

$$= \left[\left(\sum_p \delta(t - t_p) \right) * h(t) \right](t) \qquad \underline{\text{Convolution}}$$

$$= \int \sum_p \delta(\tau - t_p) \, h(t - \tau) \, d\tau$$

$$= \sum_p \int \delta(\tau - t_p) h(t - \tau) d\tau \qquad \tau - t_p = 0 \Rightarrow \tau = t_p$$

$$= \sum_p h(t - t_p) = \text{sum of PSC filters, one for each spike}$$