

# Estimating HRF and covariance structure

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# Estimating HRF

- Use one block at a time
- Code the twelve stimuli as 1-12, the “null” signal as 13, and the 6 “calibration” signals as 14-19
- Transform stimuli assignments to a matrix  $S$ , dimension of  $S$  is  $T \times K$ ,  $T$  is the time of time points,  $K$  the number of stimuli types

$$\begin{bmatrix} 1 \\ 0 \\ 0 \\ 0 \\ 3 \\ \vdots \end{bmatrix} \rightarrow S = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ \vdots & \vdots & \vdots & \vdots \end{bmatrix}$$

# Estimating HRF

Transform estimated or assumed HRF  $h = (h_1, \dots, h_{30})$  to matrix  $H(h)$ .  
Dimension of  $H(h)$  is  $T \times T$

$$h = \begin{bmatrix} h_1 \\ h_2 \\ h_3 \\ h_4 \\ h_5 \\ \vdots \end{bmatrix} \rightarrow H(h) = \begin{bmatrix} h_1 & 0 & 0 & \dots \\ h_2 & h_1 & 0 & \dots \\ h_3 & h_2 & h_1 & \dots \\ h_4 & h_3 & h_2 & \dots \\ h_5 & h_4 & h_3 & \dots \\ \vdots & \vdots & \vdots & \vdots \end{bmatrix}$$