

$$\frac{dx_i}{dt} = \frac{-x_i + u_i + \sum_{j=1}^J w_{ij} b_j r_j}{\tau_d}$$

$$r_i = \phi \left(x_i - a_{0_i} - c \sum_{k=1}^K a_{ik} \right)$$

$$\frac{da_{ik}}{dt} = \frac{-a_{ik} + r_i}{\tau_k}$$

$$\frac{db_i}{dt} = \frac{1-b_i}{\tau_{rec}} - \frac{b_i r_i}{\tau_{rel}}$$