



C

ST-DNA-DDA ρ_{s_i} ρ_{s_j}

$$\begin{pmatrix} \dot{x}_i(t) \\ \dot{x}_i(t+1) \\ \vdots \\ \dot{x}_i(t+L-1) \end{pmatrix} = \begin{pmatrix} \dot{x}_i(t-\tau_1) & \dot{x}_i(t-\tau_2) & \dot{x}_i(t-\tau_1)\dot{x}_i(t-\tau_2) \\ \dot{x}_i(t+1-\tau_1) & \dot{x}_i(t+1-\tau_2) & \dot{x}_i(t+1-\tau_1)\dot{x}_i(t+1-\tau_2) \\ \vdots & \vdots & \vdots \\ \dot{x}_i(t+L-1-\tau_1) & \dot{x}_i(t+L-1-\tau_2) & \dot{x}_i(t+L-1-\tau_1)\dot{x}_i(t+L-1-\tau_2) \end{pmatrix} \begin{pmatrix} a_1 \\ a_2 \\ a_3 \end{pmatrix}$$

$$\begin{pmatrix} \dot{x}_j(t) \\ \dot{x}_j(t+1) \\ \vdots \\ \dot{x}_j(t+L-1) \end{pmatrix} = \begin{pmatrix} \dot{x}_j(t-\tau_1) & \dot{x}_j(t-\tau_2) & \dot{x}_j(t-\tau_1)\dot{x}_j(t-\tau_2) \\ \dot{x}_j(t+1-\tau_1) & \dot{x}_j(t+1-\tau_2) & \dot{x}_j(t+1-\tau_1)\dot{x}_j(t+1-\tau_2) \\ \vdots & \vdots & \vdots \\ \dot{x}_j(t+L-1-\tau_1) & \dot{x}_j(t+L-1-\tau_2) & \dot{x}_j(t+L-1-\tau_1)\dot{x}_j(t+L-1-\tau_2) \end{pmatrix} \begin{pmatrix} a_1 \\ a_2 \\ a_3 \end{pmatrix}$$

CT-DNA-DDA $\rho_{c_{i,j}}$

$$\begin{pmatrix} \dot{x}_i(t) \\ \dot{x}_i(t+1) \\ \vdots \\ \dot{x}_i(t+L-1) \\ \dot{x}_j(t) \\ \dot{x}_j(t+1) \\ \vdots \\ \dot{x}_j(t+L-1) \end{pmatrix} = \begin{pmatrix} \dot{x}_i(t-\tau_1) & \dot{x}_i(t-\tau_2) & \dot{x}_i(t-\tau_1)\dot{x}_i(t-\tau_2) \\ \dot{x}_i(t+1-\tau_1) & \dot{x}_i(t+1-\tau_2) & \dot{x}_i(t+1-\tau_1)\dot{x}_i(t+1-\tau_2) \\ \vdots & \vdots & \vdots \\ \dot{x}_i(t+L-1-\tau_1) & \dot{x}_i(t+L-1-\tau_2) & \dot{x}_i(t+L-1-\tau_1)\dot{x}_i(t+L-1-\tau_2) \\ \dot{x}_j(t-\tau_1) & \dot{x}_j(t-\tau_2) & \dot{x}_j(t-\tau_1)\dot{x}_j(t-\tau_2) \\ \dot{x}_j(t+1-\tau_1) & \dot{x}_j(t+1-\tau_2) & \dot{x}_j(t+1-\tau_1)\dot{x}_j(t+1-\tau_2) \\ \vdots & \vdots & \vdots \\ \dot{x}_j(t+L-1-\tau_1) & \dot{x}_j(t+L-1-\tau_2) & \dot{x}_j(t+L-1-\tau_1)\dot{x}_j(t+L-1-\tau_2) \end{pmatrix} \begin{pmatrix} a_1 \\ a_2 \\ a_3 \end{pmatrix}$$

Least Square Error

$$\rho = \sqrt{\frac{1}{L} \left(\dot{x} - a_1 x(t - \tau_1) + a_2 x(t - \tau_2) + a_3 x(t - \tau_1)x(t - \tau_2) \right)^2}$$

