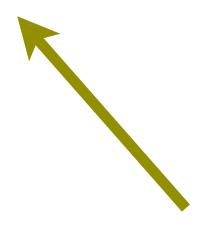
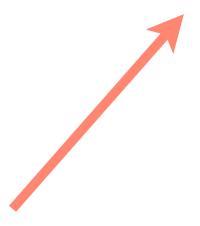
Parameter Tying













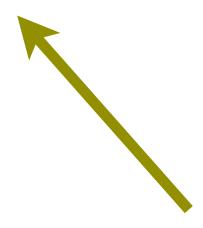








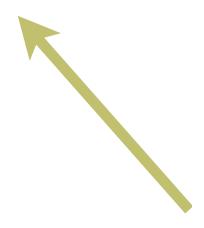
















$$\mathbf{a}_{ij} = \begin{cases} \mathbf{c}_{i-j} & 0 \le j-i < s \\ 0 & \text{o.w} \end{cases}$$

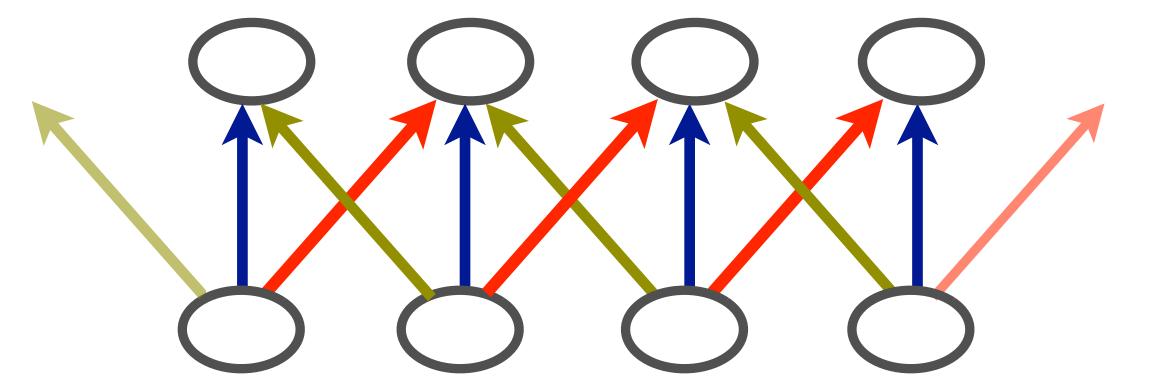
c_1	<i>C</i> ₂	<i>C</i> ₃	0	0	0	0	0
0	<i>c</i> ₁	<i>C</i> ₂	<i>C</i> ₃	0	0	0	0
0	0	<i>c</i> ₁	<i>C</i> ₂	<i>C</i> ₃	0	0	0
0	0	0	<i>c</i> ₁	c_2	<i>C</i> ₃	0	0
	• • •	• • •	• • •	• • •	• • •		

$$h_i^{r+1} = \sigma\left(\sum_{i=-s}^{s} c_i h_{i-j}^r\right)$$

$$j < 0 : c_j \equiv c_{2s+1+j}$$

Parameter Tying

$$\mathbf{a}_{ij} = \begin{cases} \mathbf{c}_{i-j} & 0 \le j-i < s \\ 0 & \text{o.w} \end{cases}$$



$$\begin{bmatrix} c_1 & c_2 & c_3 & 0 & 0 & 0 & 0 & 0 \\ 0 & c_1 & c_2 & c_3 & 0 & 0 & 0 & 0 \\ 0 & 0 & c_1 & c_2 & c_3 & 0 & 0 & 0 \\ 0 & 0 & 0 & c_1 & c_2 & c_3 & 0 & 0 \\ & & & & & & & & \\ \end{bmatrix} \begin{array}{c} \mathbf{h}_{i}^{r+1} = \sigma \left(\sum_{j=-s}^{s} \mathbf{c}_{j} \mathbf{h}_{i-j}^{r} \right) \\ \mathbf{j} = -\mathbf{s} \\ \mathbf{j} < 0 : \mathbf{c}_{j} \equiv \mathbf{c}_{2s+1+j} \\ & & & \\ \end{bmatrix}$$

$$h_i^{r+1} = \sigma \left(\sum_{j=-s}^{s} c_j h_{i-j}^r \right)$$
$$j < 0 : c_j \equiv c_{2s+1+j}$$

Parameter Symmetrization

