

Supplementary Materials: Deep Tensor Convolution on Multicores

(a) $D = 4, G = 2, S = 3$

$$\mathbf{A} = \begin{bmatrix} 1 & 1 & 1 & 0 \\ 0 & 1 & -1 & 0 \\ 0 & 1 & 1 & 1 \end{bmatrix}$$

$$\mathbf{B} = \begin{bmatrix} 1 & 0 & -1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & -1 & 1 & 0 \\ 0 & -1 & 0 & 1 \end{bmatrix}$$

$$\mathbf{C} = \begin{bmatrix} 1 & 0 \\ 1/2 & 1/2 \\ 1/2 & 1/2 \\ 0 & 1 \end{bmatrix}$$

(b) $D = 4, G = 3, S = 2$

$$\mathbf{A} = \begin{bmatrix} 1 & 1 & 1 & 0 \\ 0 & 1 & -1 & 1 \end{bmatrix}$$

$$\mathbf{B} = \begin{bmatrix} 1 & 0 & -1 & 0 \\ 0 & 1 & 1 & 0 \\ 0 & -1 & 1 & 0 \\ 0 & -1 & 0 & 1 \end{bmatrix}$$

$$\mathbf{C} = \begin{bmatrix} 1 & 0 & 0 \\ 1/2 & 1/2 & 1/2 \\ 1/2 & -1/2 & 1/2 \\ 0 & 0 & 1 \end{bmatrix}$$

(c) $D = 8, G = 4, S = 5$

$$\mathbf{A} = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 \\ 0 & 1 & -1 & 2 & -2 & 1/2 & -1/2 & 0 \\ 0 & 1 & 1 & 4 & 4 & 1/4 & 1/4 & 0 \\ 0 & 1 & -1 & 8 & -8 & 1/8 & -1/8 & 0 \\ 0 & 1 & 1 & 16 & 16 & 1/16 & 1/16 & 1 \end{bmatrix}$$

$$\mathbf{B} = \begin{bmatrix} 1 & 0 & -21/4 & 0 & 21/4 & 0 & -1 & 0 \\ 0 & 1 & 1 & -17/4 & -17/4 & 1 & 1 & 0 \\ 0 & -1 & 1 & 17/4 & -17/4 & -1 & 1 & 0 \\ 0 & 1/2 & 1/4 & -5/2 & -5/4 & 2 & 1 & 0 \\ 0 & -1/2 & 1/4 & 5/2 & -5/4 & -2 & 1 & 0 \\ 0 & 2 & 4 & -5/2 & -5 & 1/2 & 1 & 0 \\ 0 & -2 & 4 & 5/2 & -5 & -1/2 & 1 & 0 \\ 0 & -1 & 0 & 21/4 & 0 & -21/4 & 0 & 1 \end{bmatrix}$$

$$\mathbf{C} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ -2/9 & -2/9 & -2/9 & -2/9 \\ -2/9 & 2/9 & -2/9 & 2/9 \\ 1/90 & 1/45 & 2/45 & 4/45 \\ 1/90 & -1/45 & 2/45 & -4/45 \\ 32/45 & 16/45 & 8/45 & 4/45 \\ 32/45 & -16/45 & 8/45 & -4/45 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

(d) $D = 8, G = 5, S = 4$

$$\mathbf{A} = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 \\ 0 & 1 & -1 & 2 & -2 & 1/2 & -1/2 & 0 \\ 0 & 1 & 1 & 4 & 4 & 1/4 & 1/4 & 0 \\ 0 & 1 & -1 & 8 & -8 & 1/8 & -1/8 & 1 \end{bmatrix}$$

$$\mathbf{B} = \begin{bmatrix} 1 & 0 & -21/4 & 0 & 21/4 & 0 & -1 & 0 \\ 0 & 1 & 1 & -17/4 & -17/4 & 1 & 1 & 0 \\ 0 & -1 & 1 & 17/4 & -17/4 & -1 & 1 & 0 \\ 0 & 1/2 & 1/4 & -5/2 & -5/4 & 2 & 1 & 0 \\ 0 & -1/2 & 1/4 & 5/2 & -5/4 & -2 & 1 & 0 \\ 0 & 2 & 4 & -5/2 & -5 & 1/2 & 1 & 0 \\ 0 & -2 & 4 & 5/2 & -5 & -1/2 & 1 & 0 \\ 0 & -1 & 0 & 21/4 & 0 & -21/4 & 0 & 1 \end{bmatrix}$$

$$\mathbf{C} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ -2/9 & -2/9 & -2/9 & -2/9 & -2/9 \\ -2/9 & 2/9 & -2/9 & 2/9 & -2/9 \\ 1/90 & 1/45 & 2/45 & 4/45 & 8/45 \\ 1/90 & -1/45 & 2/45 & -4/45 & 8/45 \\ 32/45 & 16/45 & 8/45 & 4/45 & 2/45 \\ 32/45 & -16/45 & 8/45 & -4/45 & 2/45 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

(e) $D = 8, G = 6, S = 3$

$$\mathbf{A} = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 \\ 0 & 1 & -1 & 2 & -2 & 1/2 & -1/2 & 0 \\ 0 & 1 & 1 & 4 & 4 & 1/4 & 1/4 & 1 \end{bmatrix}$$

$$\mathbf{B} = \begin{bmatrix} 1 & 0 & -21/4 & 0 & 21/4 & 0 & -1 & 0 \\ 0 & 1 & 1 & -17/4 & -17/4 & 1 & 1 & 0 \\ 0 & -1 & 1 & 17/4 & -17/4 & -1 & 1 & 0 \\ 0 & 1/2 & 1/4 & -5/2 & -5/4 & 2 & 1 & 0 \\ 0 & -1/2 & 1/4 & 5/2 & -5/4 & -2 & 1 & 0 \\ 0 & 2 & 4 & -5/2 & -5 & 1/2 & 1 & 0 \\ 0 & -2 & 4 & 5/2 & -5 & -1/2 & 1 & 0 \\ 0 & -1 & 0 & 21/4 & 0 & -21/4 & 0 & 1 \end{bmatrix}$$

$$\mathbf{C} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 \\ -2/9 & -2/9 & -2/9 & -2/9 & -2/9 & -2/9 \\ -2/9 & 2/9 & -2/9 & 2/9 & -2/9 & 2/9 \\ 1/90 & 1/45 & 2/45 & 4/45 & 8/45 & 16/45 \\ 1/90 & -1/45 & 2/45 & -4/45 & 8/45 & -16/45 \\ 32/45 & 16/45 & 8/45 & 4/45 & 2/45 & 1/45 \\ 32/45 & -16/45 & 8/45 & -4/45 & 2/45 & -1/45 \\ 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$