Algorithms for Matrix Multiplication

Algorithm 1 Haar Wavelet Multiplication

Require: Matrices A and B

$$\hat{A} \leftarrow \psi^n(A)$$

$$\hat{B} \leftarrow \psi^n(B)$$

$$\hat{C} \leftarrow \hat{A} \cdot \hat{B}$$

$$C \leftarrow \psi^{-n} \left(\hat{C} \right)$$

Algorithm 2 Sparse Haar Wavelet Multiplication

Require: Matrices A and B

$$\hat{A} \leftarrow \psi^n(A)$$

$$\hat{B} \leftarrow \psi^n(B)$$

$$l_A \leftarrow \text{sparsify } (\hat{A})$$

$$l_A \leftarrow \text{sparsify } (\hat{A})$$

$$l_B \leftarrow \text{sparsify } (\hat{B})$$

$$l_C \leftarrow \text{sparse multiply } (l_A, l_B)$$

$$\hat{C} \leftarrow \text{densify } (\hat{C})$$

$$C \leftarrow \psi^{-n} \left(\hat{C} \right)$$