The general wavelet based matrix multiply is as follows:

1. Arguments:
   - A : a $m \times p$ matrix
   - B: a $p \times n$ matrix
2. Results: C : a $m \times n$ matrix
3. Procedure:
   - $A \xrightarrow{\psi} \alpha$
   - $B \xrightarrow{\psi} \beta$
   - $\alpha \overset{ChainRow}{\rightarrow} \alpha^c$
   - $\beta \overset{ChainColumn}{\rightarrow} \beta^c$
   - Chain Multiply $(\alpha^c, \beta^c) \rightarrow C$