## Exhaustive Computation of the Partition Function - O((2N-3)!!) $Z(\{a,b,c,d\}) = \psi(\{a,b,c\},\{d\}) \cdot \psi(\{a,b\},\{c\}) \cdot \psi(\{a\},\{b\})$ $+ \psi(\{a,b,c\},\{d\}) \cdot \psi(\{a,c\},\{b\}) \cdot \psi(\{a\},\{c\})$ $+ \psi(\{a,b,c\},\{d\}) \cdot \psi(\{b,c\},\{a\}) \cdot \psi(\{b\},\{c\})$ $+ \psi(\{a,c,d\},\{b\}) \cdot \psi(\{a,c\},\{d\}) \cdot \psi(\{a\},\{c\})$ $+ \psi(\{a,c,d\},\{b\}) \cdot \psi(\{a,d\},\{c\}) \cdot \psi(\{a\},\{d\})$ $+ \psi(\{a,c,d\},\{b\}) \cdot \psi(\{c,d\},\{a\}) \cdot \psi(\{c\},\{d\})$ $+ \psi(\{a,b,d\},\{c\}) \cdot \psi(\{a,b\},\{d\}) \cdot \psi(\{a\},\{b\})$ $+ \psi(\{a,b,d\},\{c\}) \cdot \psi(\{a,d\},\{b\}) \cdot \psi(\{a\},\{d\})$ $+ \psi(\{a,b,d\},\{c\}) \cdot \psi(\{b,d\},\{a\}) \cdot \psi(\{b\},\{d\})$ $+ \psi(\{b, c, d\}, \{a\}) \cdot \psi(\{b, c\}, \{d\}) \cdot \psi(\{b\}, \{c\})$ $+ \psi(\{b, c, d\}, \{a\}) \cdot \psi(\{b, d\}, \{c\}) \cdot \psi(\{b\}, \{d\})$ $+ \psi(\{b, c, d\}, \{a\}) \cdot \psi(\{c, d\}, \{d\}) \cdot \psi(\{c\}, \{d\})$ $+ \psi(\{a,b\},\{c,d\}) \cdot \psi(\{a\},\{b\}) \cdot \psi(\{c\},\{d\})$ $+ \psi(\{a,c\},\{b,d\}) \cdot \psi(\{a\},\{c\}) \cdot \psi(\{b\},\{d\})$

## Computation using Trellis - $O(3^N) << O((2N-3)!!)$

