Variable Elimination in Chains

Elimination in Chains

$$P(E) \propto \sum_D \sum_C \sum_B \sum_A \tilde{P}(A,B,C,D,E)$$

$$= \sum_D \sum_C \sum_B \sum_A \Phi_1(A,B)\,\phi_2(B,C)\,\phi_3(C,D)\,\phi_4(D,E)$$

$$= \sum_D \sum_C \sum_B \Phi_2(B,C)\,\Phi_3(C,D)\,\Phi_4(D,E) \sum_A \Phi_1(A,B)$$

$$\tau_1(B)$$

$$= \sum_D \sum_C \sum_B \Phi_2(B,C)\,\Phi_3(C,D)\,\Phi_4(D,E)\,\tau_1(B)$$