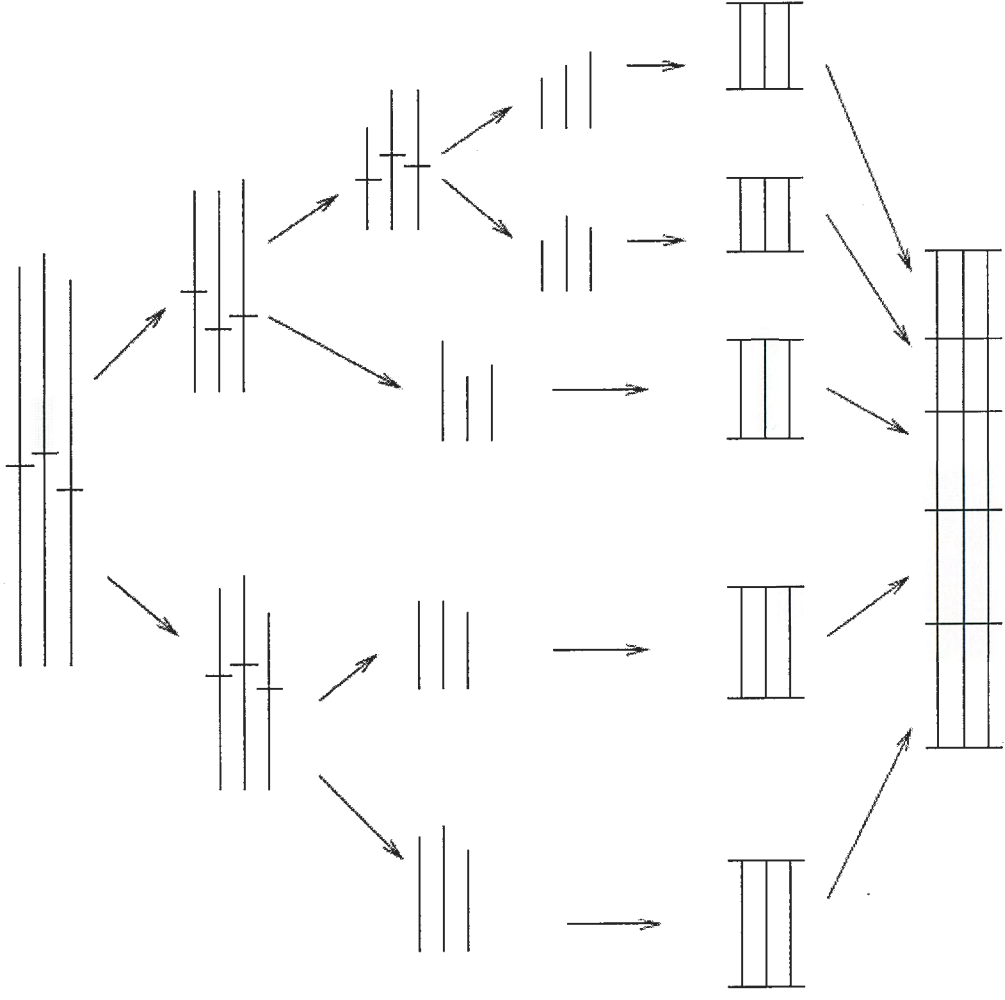


Divide and Conquer Alignment (DCA)



$$D_{SP}(A^c) = \sum_{i < j} D_2(\pi_{ij}(A^c)) \quad \text{Def. Sum. of Pairs}$$

$$= \frac{1}{2} \sum_{i, j} D_2(\pi_{ij}(A^c)) \quad \text{Symmetrie}$$

$$D_2(\pi_{ii}(A^c)) = 0$$

$$\leq \frac{1}{2} \sum_{i, j} \left\{ D_2(\pi_{ic}(A^c)) + D_2(\pi_{cj}(A^c)) \right\}$$

Dreiecksungleichung

$$= \frac{1}{2} \sum_{i, j} \left\{ D(s_i, s_c) + D(s_c, s_j) \right\}$$

Definition von A^c

$$= \frac{1}{2} k \cdot \sum_i D(s_i, s_c) + \frac{1}{2} k \cdot \sum_j D(s_c, s_j)$$

Summe auseinanderziehen

$$= k \cdot \sum_j D(s_c, s_j) \quad \text{Symmetrie}$$

$$\leq \sum_j \sum_i D(s_i, s_j) \quad D(s_c, s_j) \text{ ist minimal}$$

$$= \sum_{i, j} D(s_i, s_j)$$

$$\leq \sum_{i, j} D_2(\pi_{ij}(A^{\text{opt}})) \quad D(s_i, s_j) \text{ optimal}$$

$$= 2 \cdot \sum_{i < j} D_2(\pi_{ij}(A^{\text{opt}})) = 2 D_{SP}(A^{\text{opt}})$$