

Lecture: Spezielle Algorithmen der Sequenzanalyse
Summer semester 2006

Exercises

Exercise 5, Discussion: 05/10/2006.

1. **Parametric alignment.**

Prove Observation 4.1 of the lecture notes.

2. **Parametric alignment.**

Algorithm 4.1 finds the point r where the ray h intersects the border of a convex set of optimal alignment scores according to certain parameters.

Put into your own words, how the algorithm finds the border point.

3. **Parametric alignment.**

Given two strings $s_1 = \text{GAG}$ and $s_2 = \text{AATTG}$ and Match and mismatch score are fixed to $m = 4$ and $u = -4$, respectively.

Let $P = (-4, -2)$ be the current point in the $(\text{gapinit}, \text{gapext})$ parameter space and R the ray R defined by $R = P + r(1, 1), r \in \mathcal{R}_0^+$.

Compute the optimal alignment A_P at point P and find the furthest point on R where A_P remains optimal.