

Exercises for Computational Physics (physik760)

WS 2019/2020

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Exercises for the week from 2nd to 6th of December 2019.

Simulated Annealing

1: Consider the following data

t	x
1	0.94(11)
2	1.95(10)
3	3.15(13)

to which we want to fit the two-parameter function

$$f(t; a, b) = at + b$$

minimizing the χ^2 . We assume that the data points are independent.

Implement simulated annealing to minimize the χ^2 -function. Compare your result with the standard estimator for linear regressions \bar{T}_β .

For your implementation

- make sure you keep track of the minimal value for the χ^2 -function and the corresponding parameters the algorithm found.
- optimise the proposal distribution, which is typically a Gaussian distribution with a certain width.
- optimise the number of iterations you perform at fixed temperature T .
- optimise your strategy of reducing the temperature T .