RNA-RNA interaction prediction using seed extension

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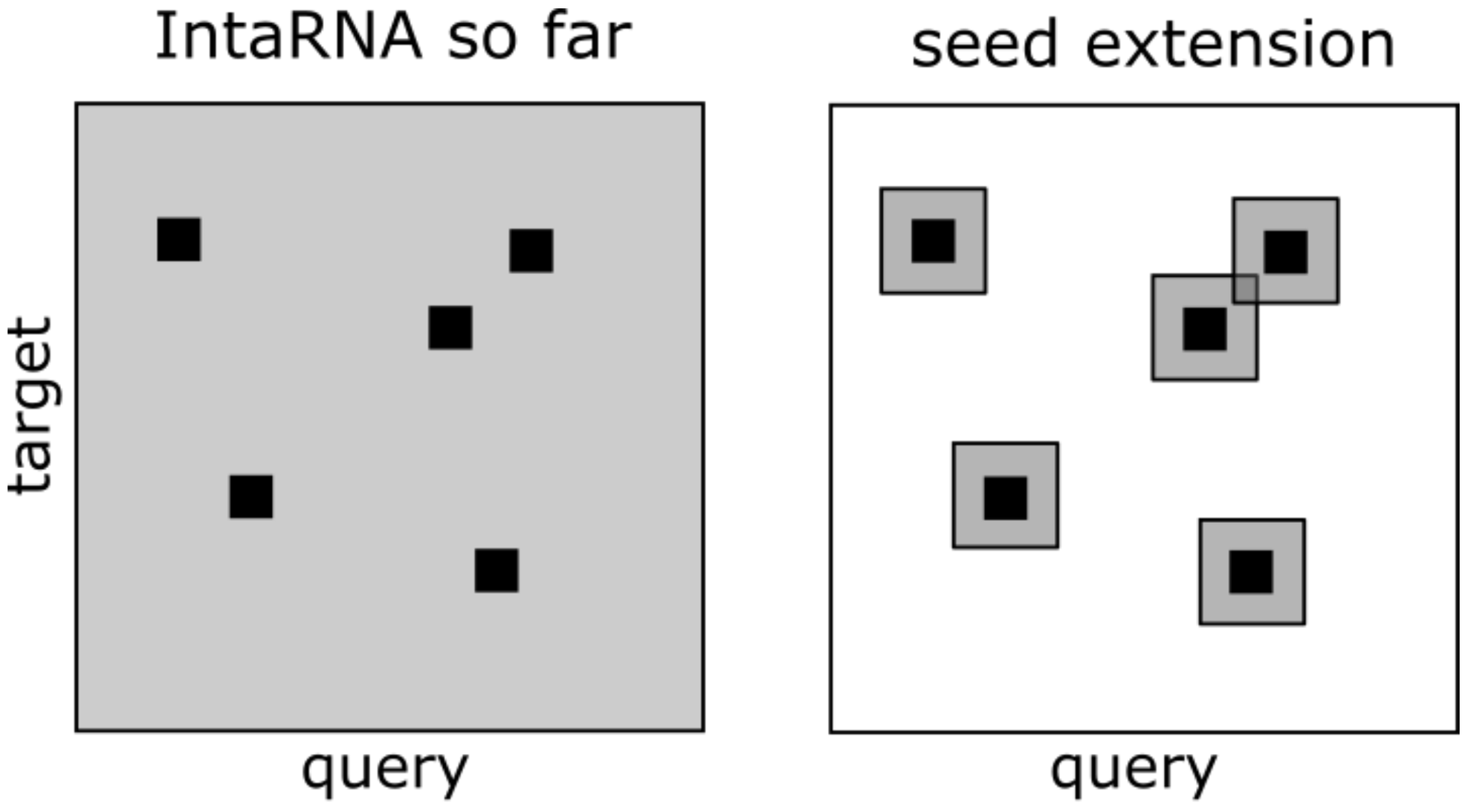
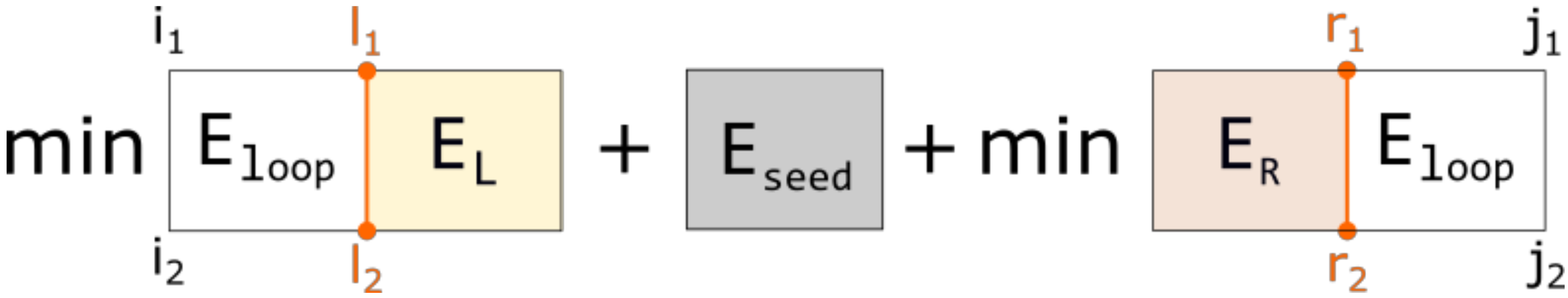
Motivation


IntaRNA so far
seed extension
target
query
query
Seed
eg: sTarPicker
RiBlast
RiSearch2

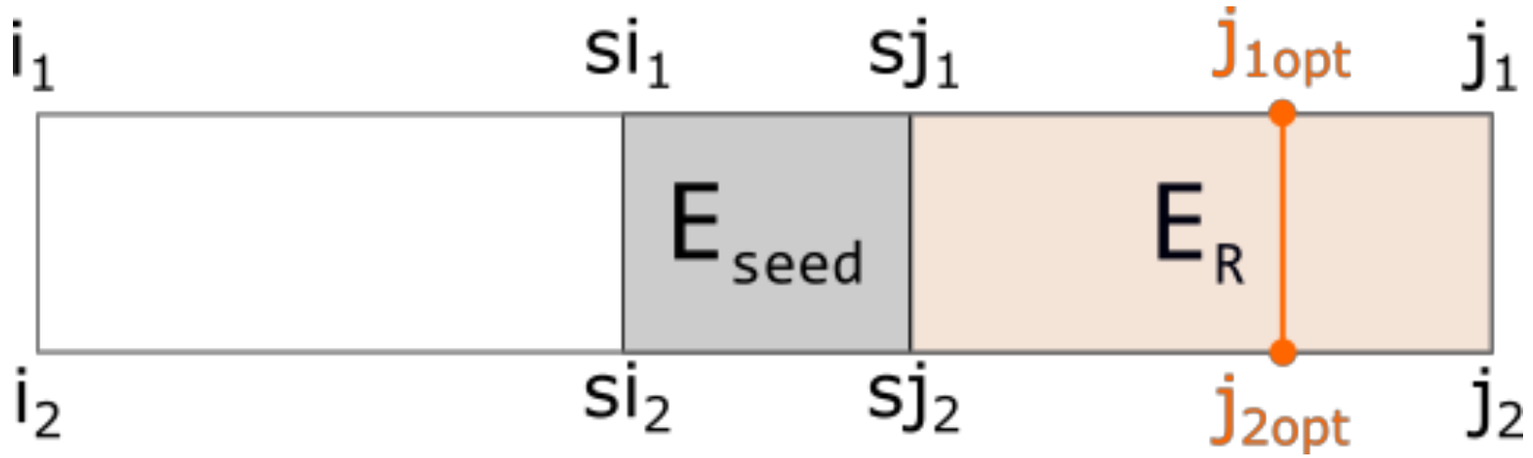
Exact memory efficient method

Search minimum over all seeds using:

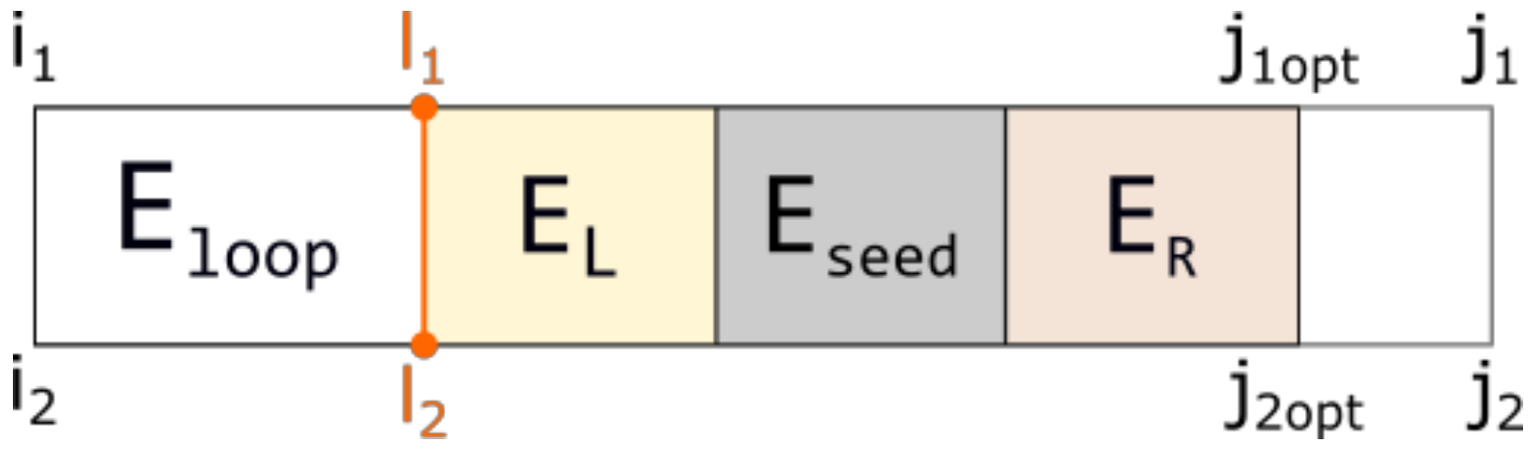


Heuristic method

- First find j_1 and j_2 that minimalize E_R

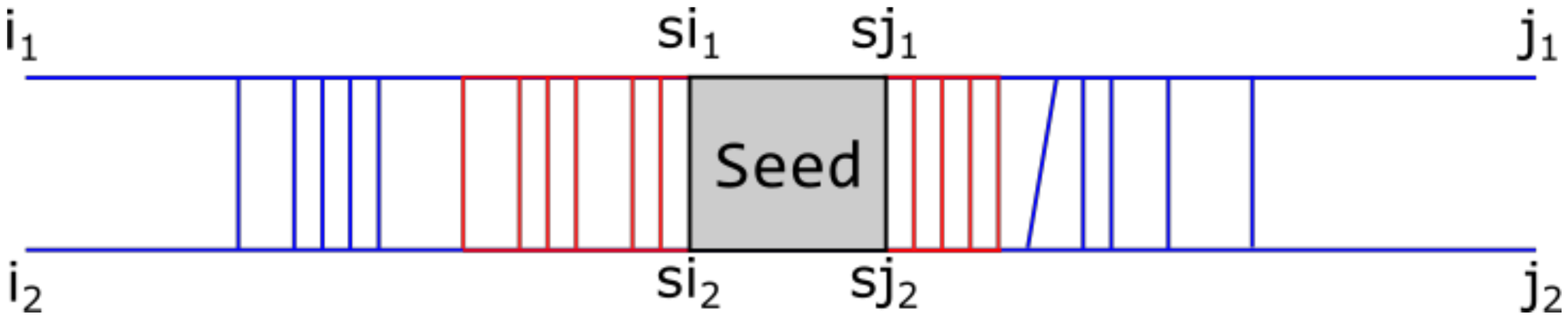


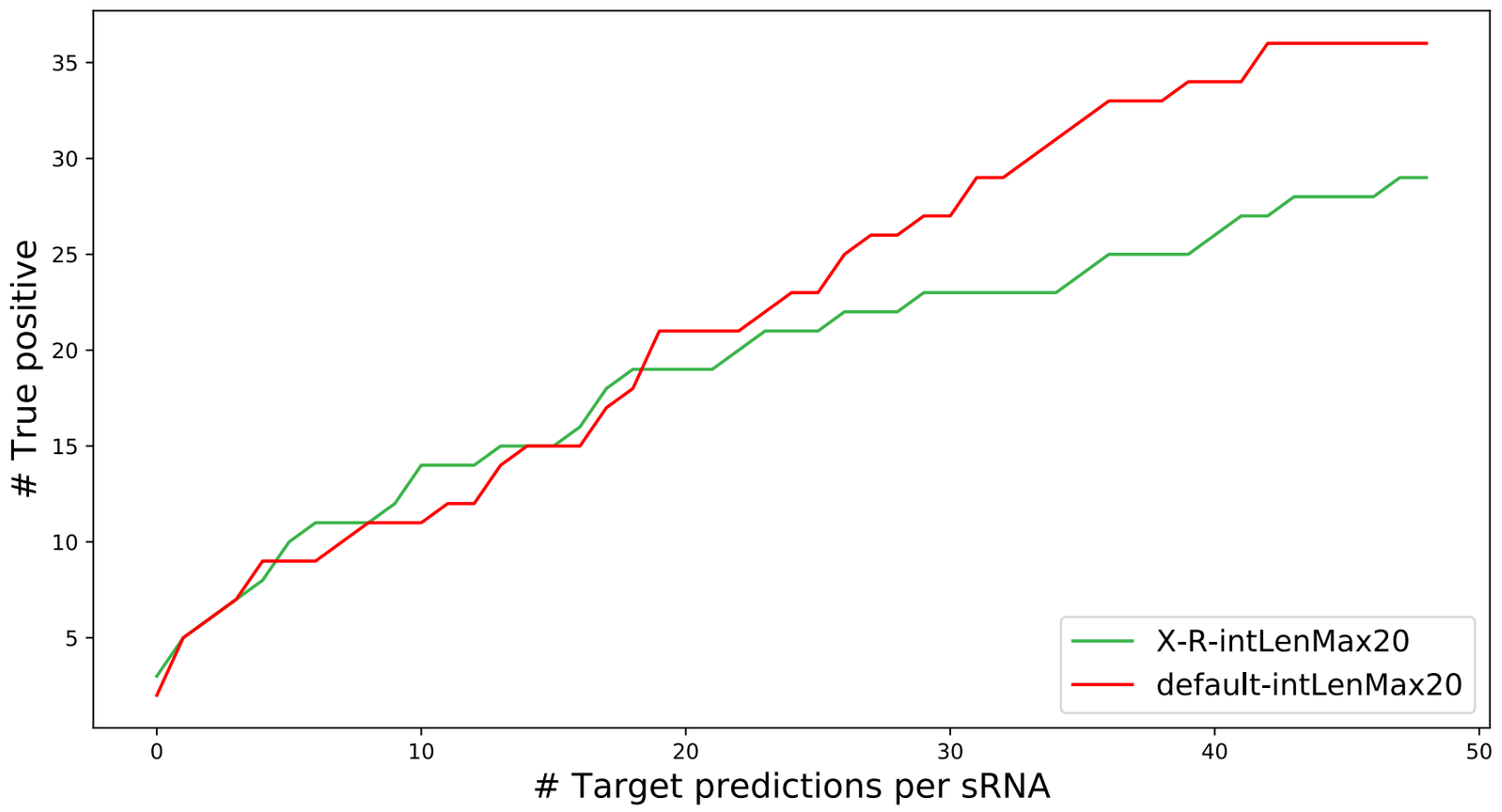
- Then minimize over entire interaction up to j_{1opt}, j_{2opt}



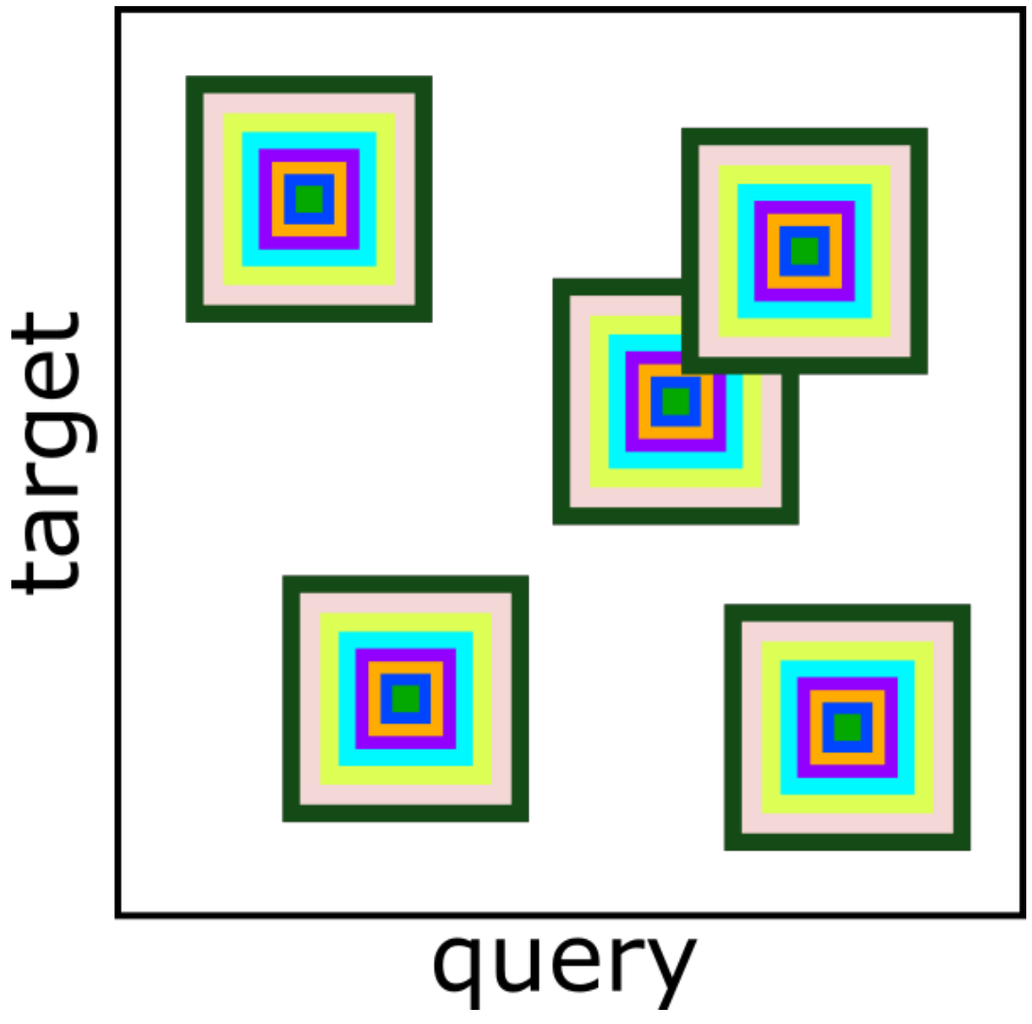
Riblast method

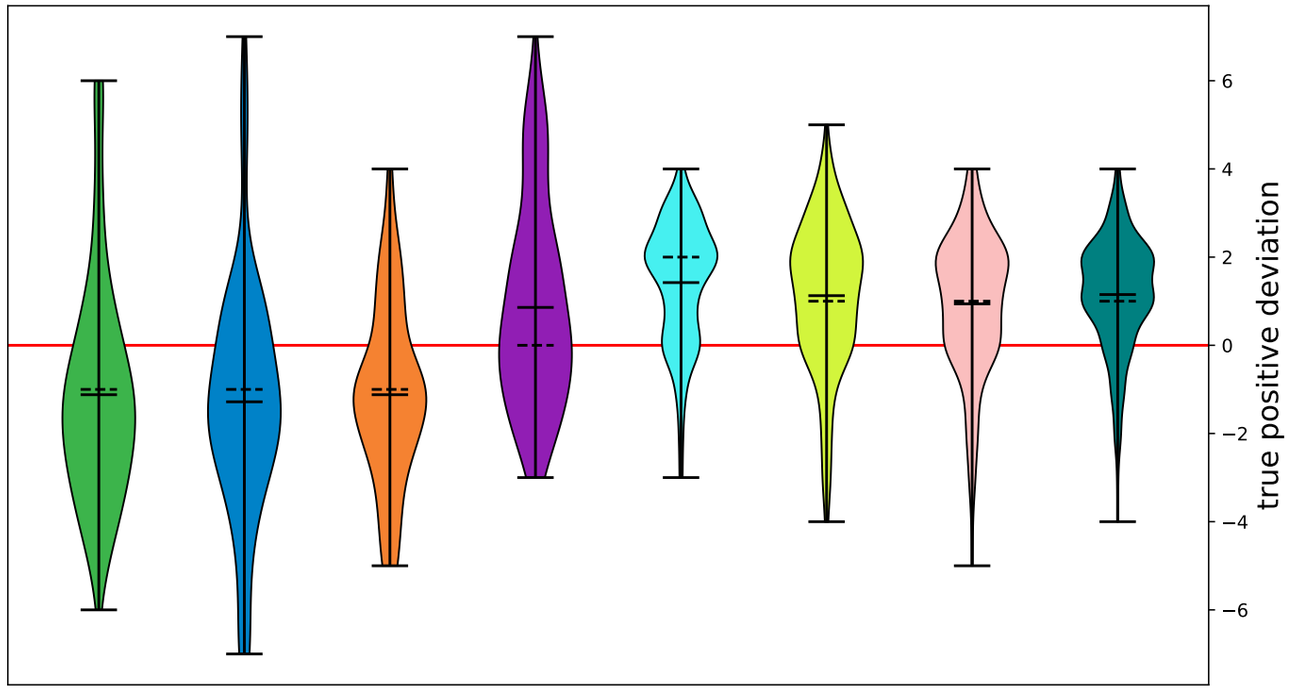
First do a parallel extension, then thorough extension

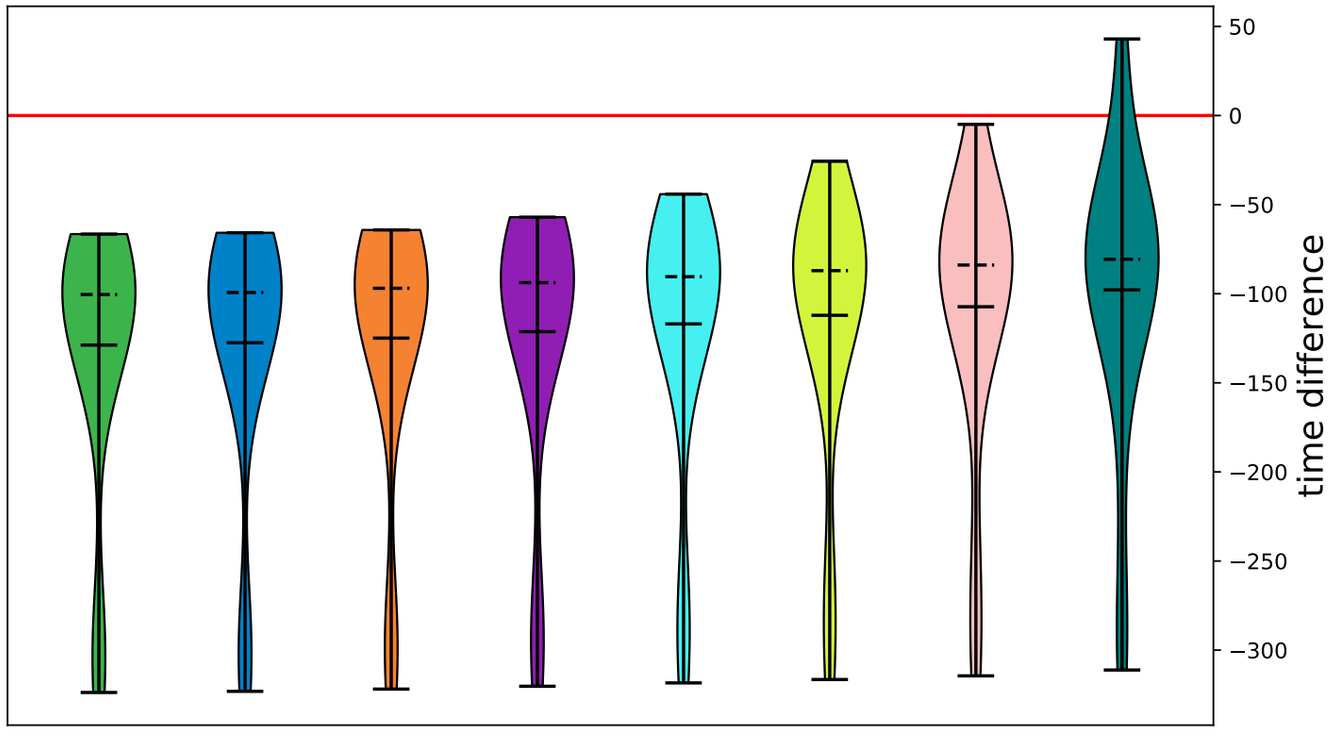




Length-dependence





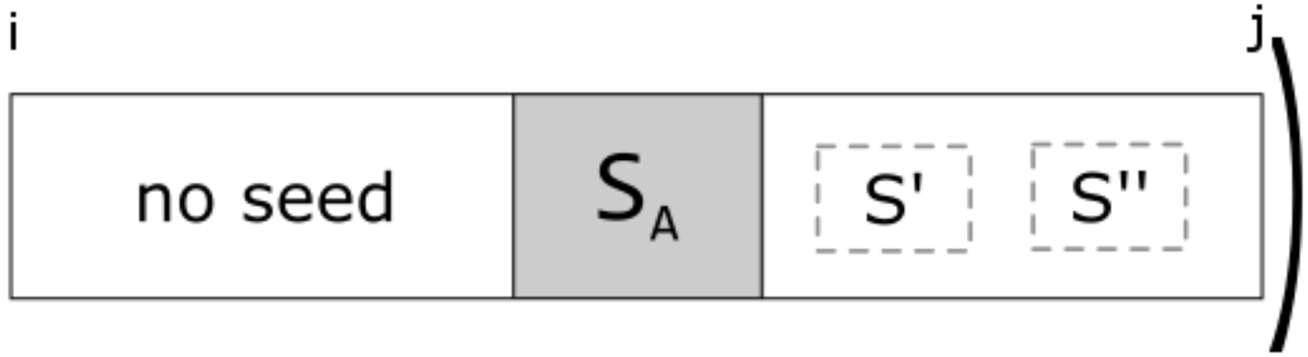


Partition function

Goal: Find probabilities of interactions

$$P_{i,j} = \frac{Z_{i,j}}{Z}$$

$$Z_{i,j} = \sum_{S_A} \left(\right.$$



$$\left. \right)$$

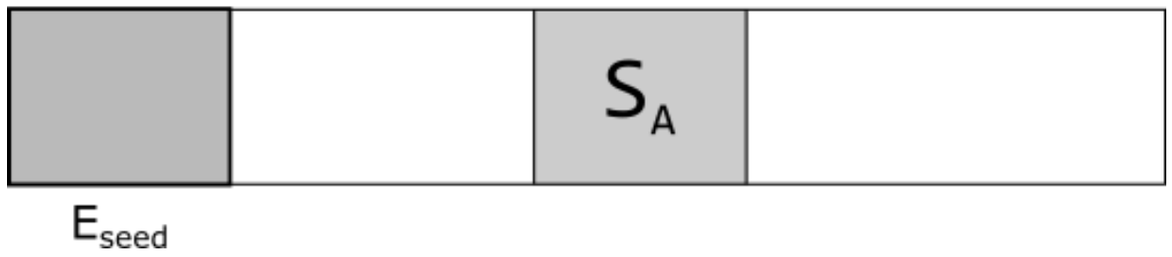
$$Z = \sum Z_{i,j}$$

$$Z_{i,j} = \sum_{S_A} \left(\begin{array}{cccc} \overset{i}{} & & & \overset{j}{} \\ \text{no seed} & S_A & S' & S'' \end{array} \right)$$

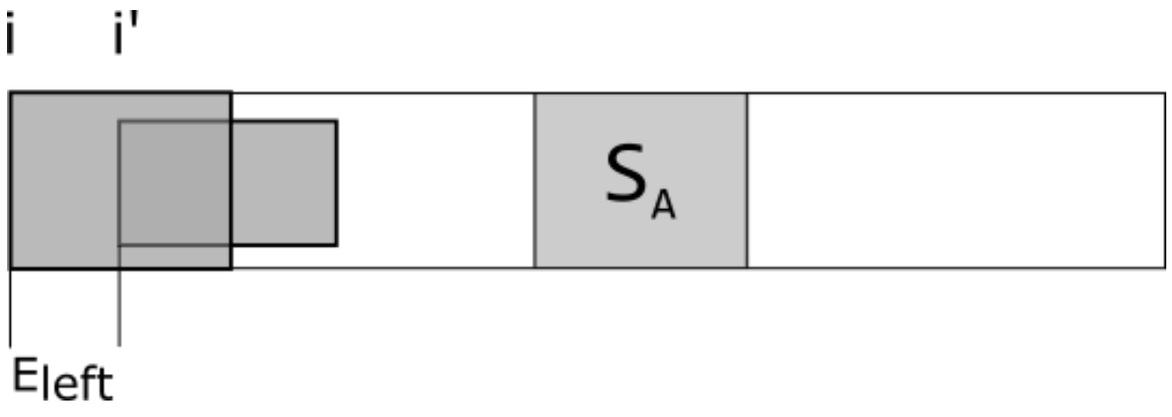
Idea: remove seed for i

Cases:

A)



B)



$$Z - w(E_{left}) \cdot Z_{i',j'}$$