

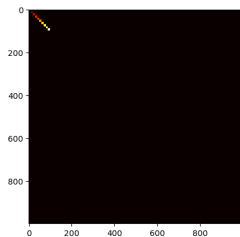
Weekly Report

WU Zihan

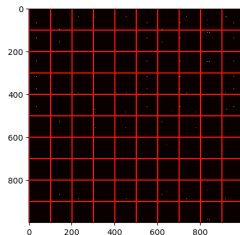
September 14, 2023

Probability Model

- ▶ Target: Reconstruct biclusters in big matrix;
- ▶ Method: Partition the matrix into small blocks and reconstruct biclusters in each block larger than $T_m \times T_n$;
- ▶ Probability Model: We construct the probability model to decide T_p re-partition times to ensure the probability of missing biclusters is less than ϵ .



(a) Original matrix A



(b) Partition matrix A into blocks

Results for simulated data matrix

Experiment settings

- ▶ $A \in \mathbb{R}^{M \times N}$,
 $M = N = 1000$
- ▶ Biclusters number $K = 10$
- ▶ Bicluster height
 $\phi_1 = \phi_2 = \dots = \phi_K = \phi$
- ▶ Bicluster width
 $\psi_1 = \psi_2 = \dots = \psi_K = \psi$
- ▶ Threshold $T_m = T_n = 4$

Experiment results

$$T_p \geq \frac{\ln(1 - p_0)}{-2[m\phi(s^{(k)})^2 + n\psi(t^{(k)})^2]}$$

- ▶ According to computation,
 $T_p \geq 303.024$ to ensure the probability of missing biclusters is less than 1%.
- ▶ We set $T_p = 304$ and do 1000 experiments, in which 992 successful detections are observed.