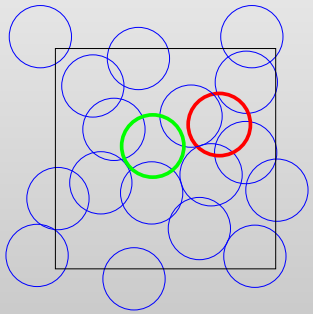
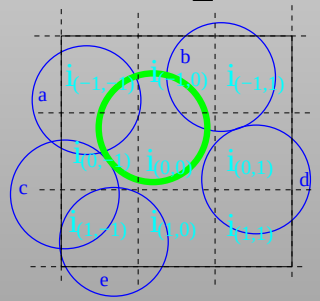
the hash cell algorithm

$d > r$

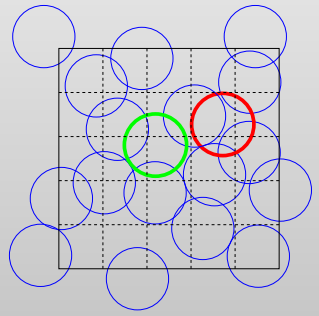


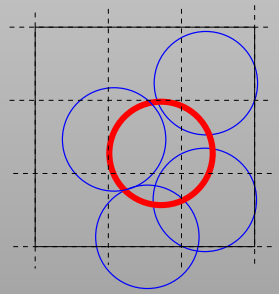
$\#d = \frac{N}{2}(N-1)$



$\#d = \frac{N}{2}(N-1)(\frac{3}{m})^D$

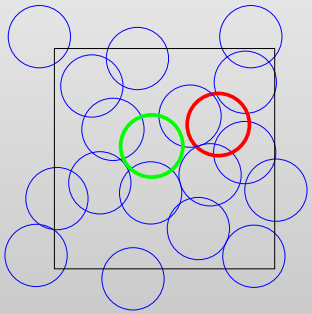
$m = 5$



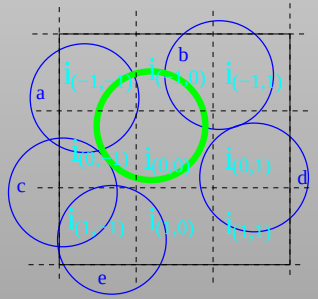


the hash cell algorithm

$d > r$

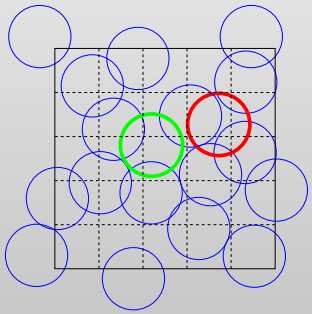


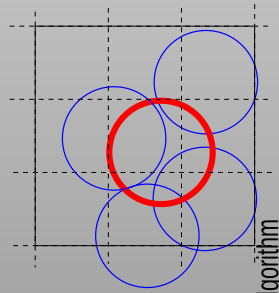
$$\#d = \frac{N}{2}(N-1)$$



$$\#d = \frac{N}{2}(N-1)\left(\frac{3}{m}\right)^D$$

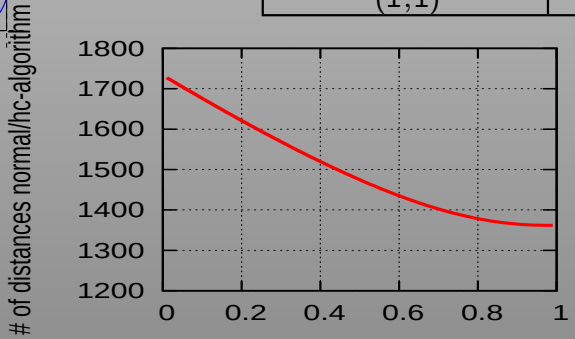
$m = 5$



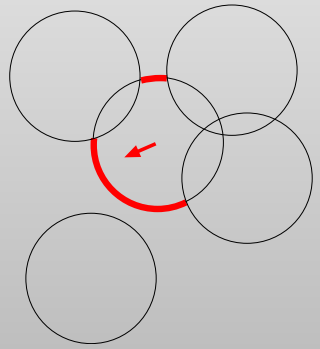


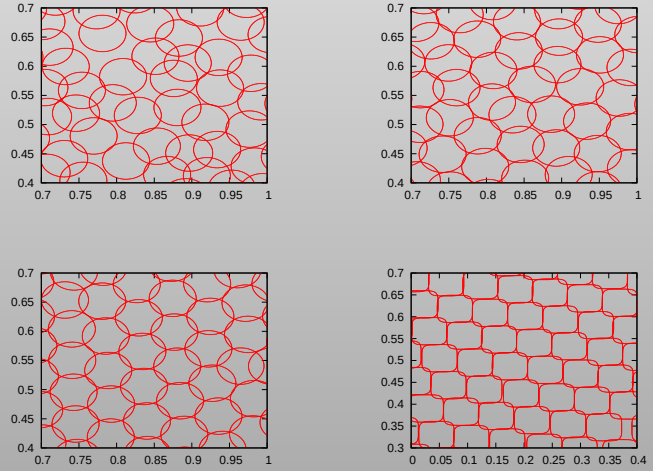
- devide the space into hash cells: $l \geq r$
- candidate with a random position
- map the position to the hash cell index
- read out all templates of this and the adjacent hash cells
- comput the distances
- reject or accept the candidate

hash cell index	template
$i_{(-1,-1)}$	a
$i_{(-1,0)}$	
$i_{(-1,1)}$	b
$i_{(0,-1)}$	
$i_{(0,0)}$	
$i_{(0,1)}$	d
$i_{(1,-1)}$	c,e
$i_{(1,0)}$	
$i_{(1,1)}$	

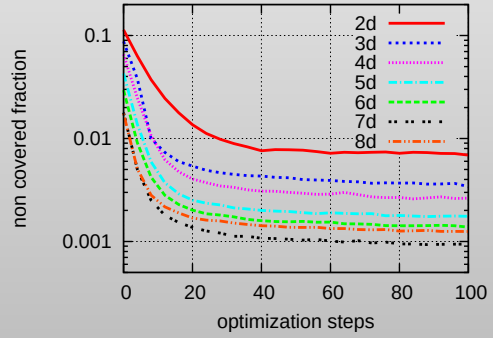


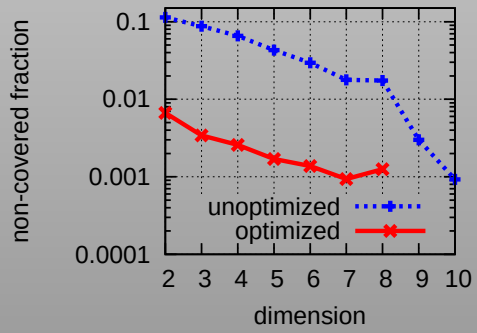
template optimization



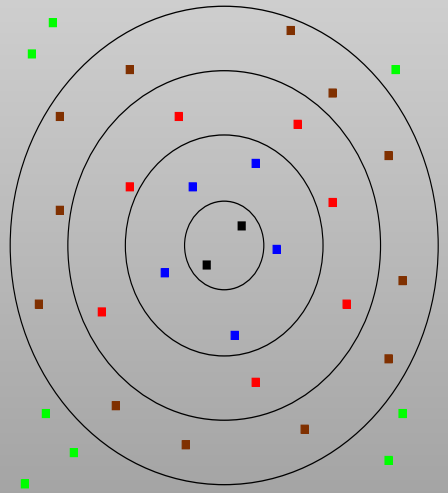


http://130.75.116.10/~fehrmann/hc/4.5.gif

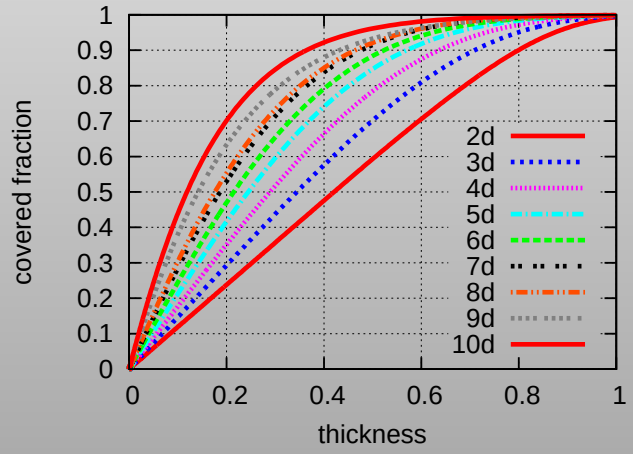




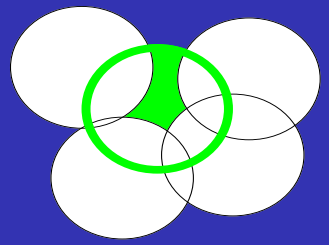
monte carlo integration



a	counter
$a \leq \frac{1}{4}r$	2
$\frac{1}{4}r < a \leq \frac{2}{4}r$	5
$\frac{2}{4}r < a \leq \frac{3}{4}r$	7
$\frac{3}{4}r < a \leq r$	12
$r < a$	8

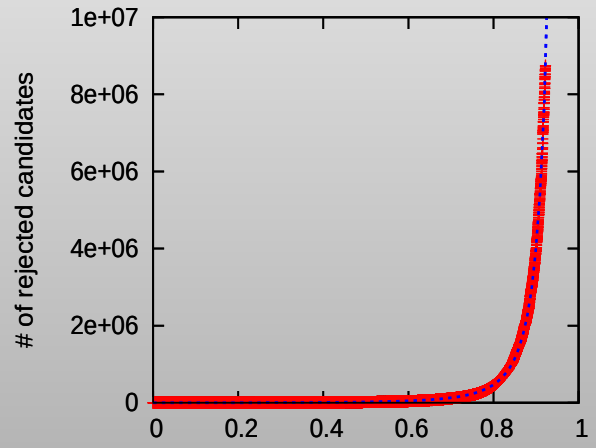


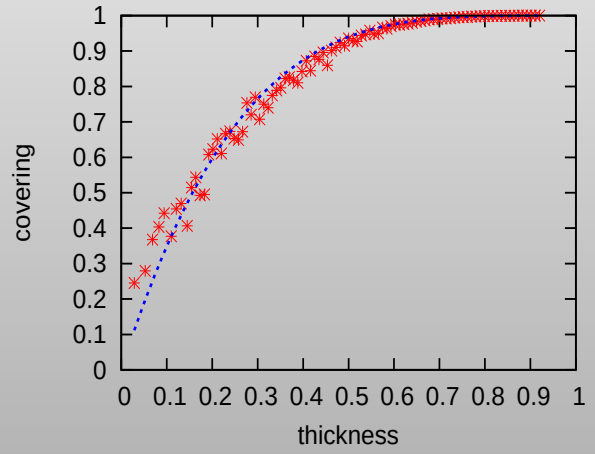
model: $\langle \Delta n \rangle = \alpha n^{\beta}$



$$N_r = \frac{1-\beta}{\beta} N_1 \left(1 - \frac{N}{N_1}\right)^{-\frac{\beta}{1-\beta}} - N - \frac{1-\beta}{\beta} N_1$$

$$c(N) = 1 - \left(1 - \frac{N}{N_1}\right)^{\frac{1}{1-\beta}}$$





$$\langle N_{rej} \rangle = \frac{N_1}{2-\beta} \left(1 - \beta - \frac{n(N)}{c(N)} \frac{N}{N_1}\right)$$