

Self-emitted
radiosity

reflectivity

total
radiosity

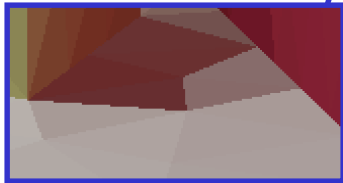
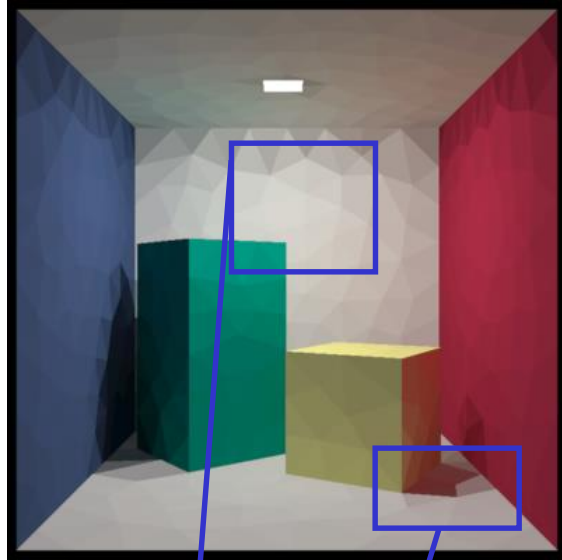
$$B_i = E_i + \rho_i \sum_j F_{ij} B_j$$

Form factor

Fig 6.1

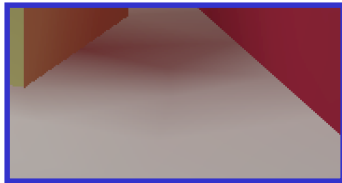
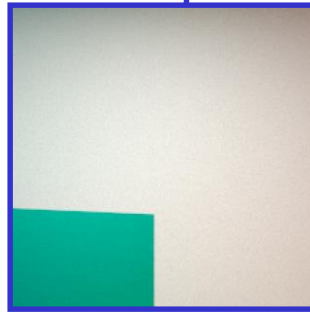
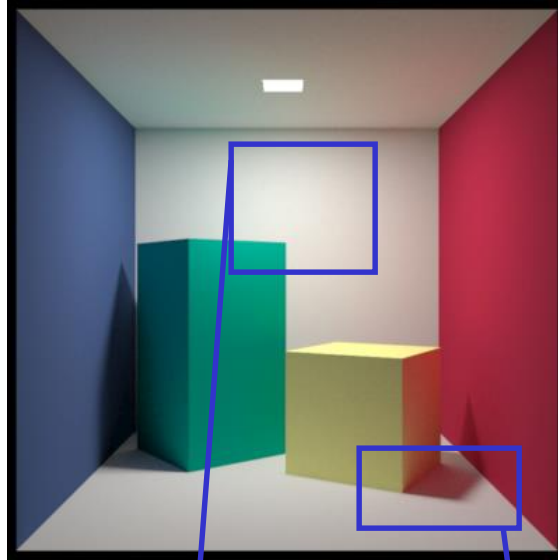
Discretisation Artifacts

Constant Approximation



flat

"true" solution



Gouraud

Quadratic Approximation

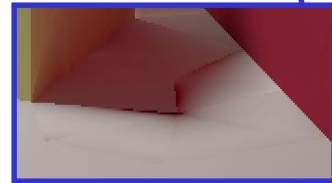
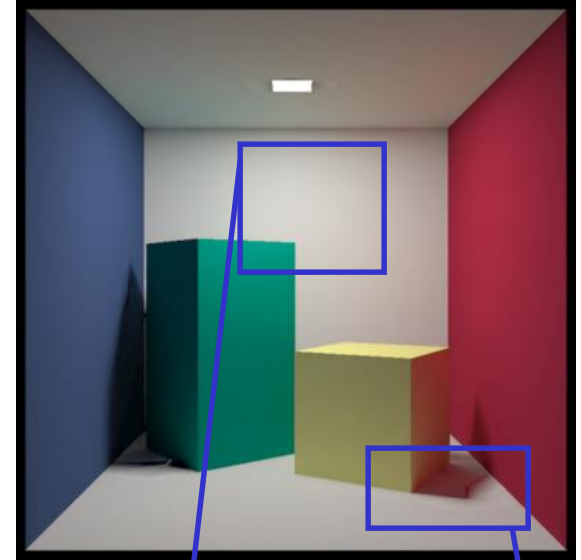


Fig 6.2

Form Factor Singularities and Discontinuities

$$F_{ij} = \frac{1}{A_i} \int_{S_i} \int_{S_j} G(x, y) dA_y dA_x$$

$$G(x, y) = \frac{\cos \theta_x \cos \theta_y}{\pi r_{xy}^2} \text{vis}(x, y).$$

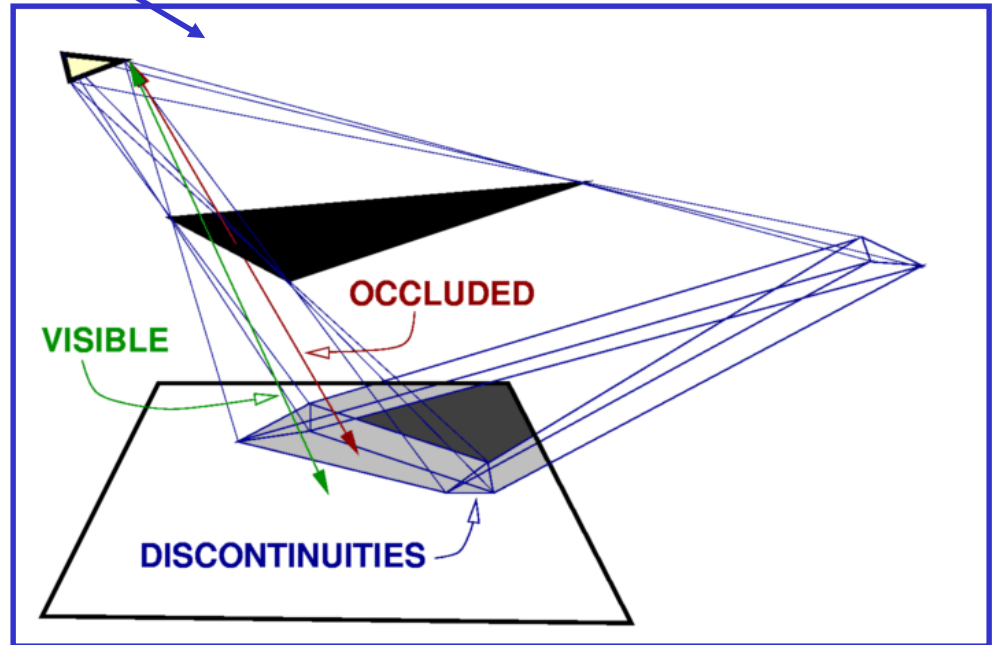
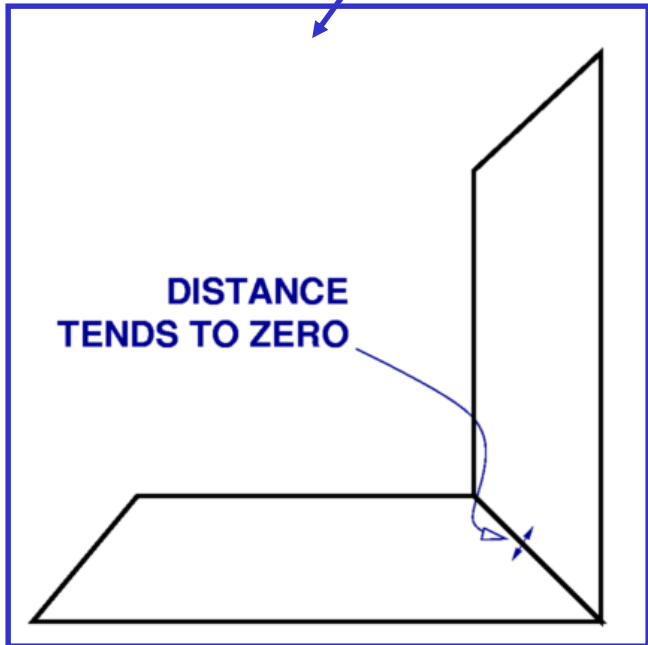
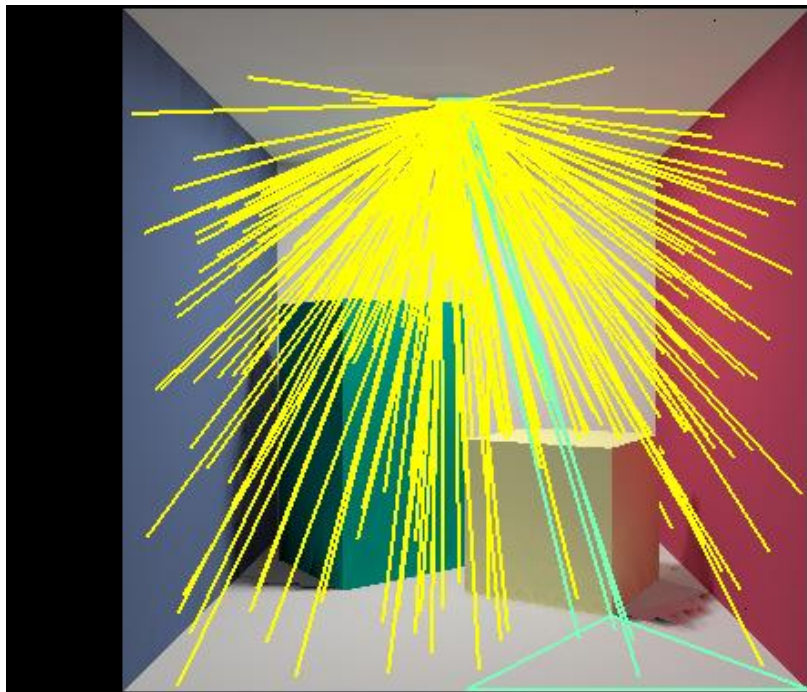
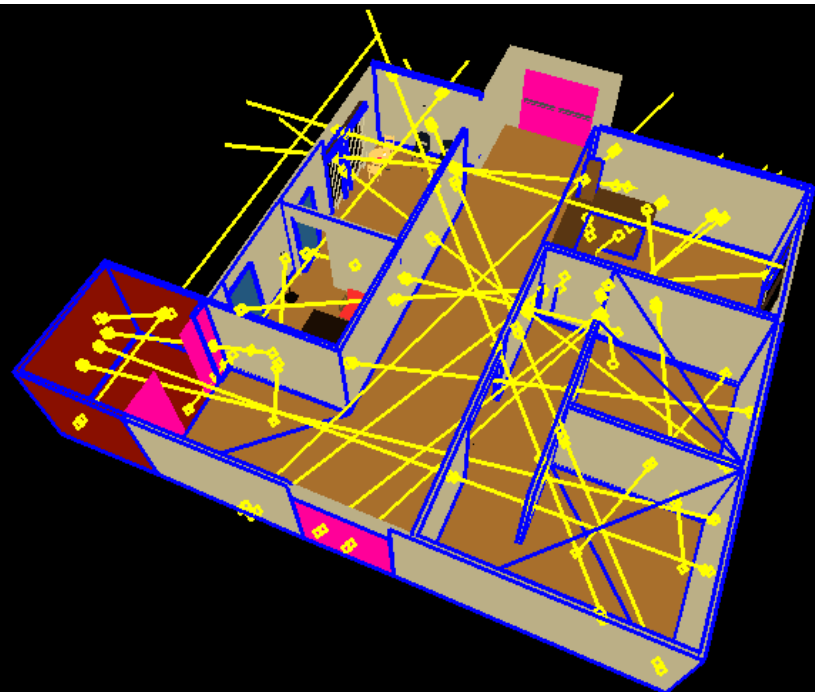


Fig 6.3

Form Factor Sampling



Local Lines



Global Lines

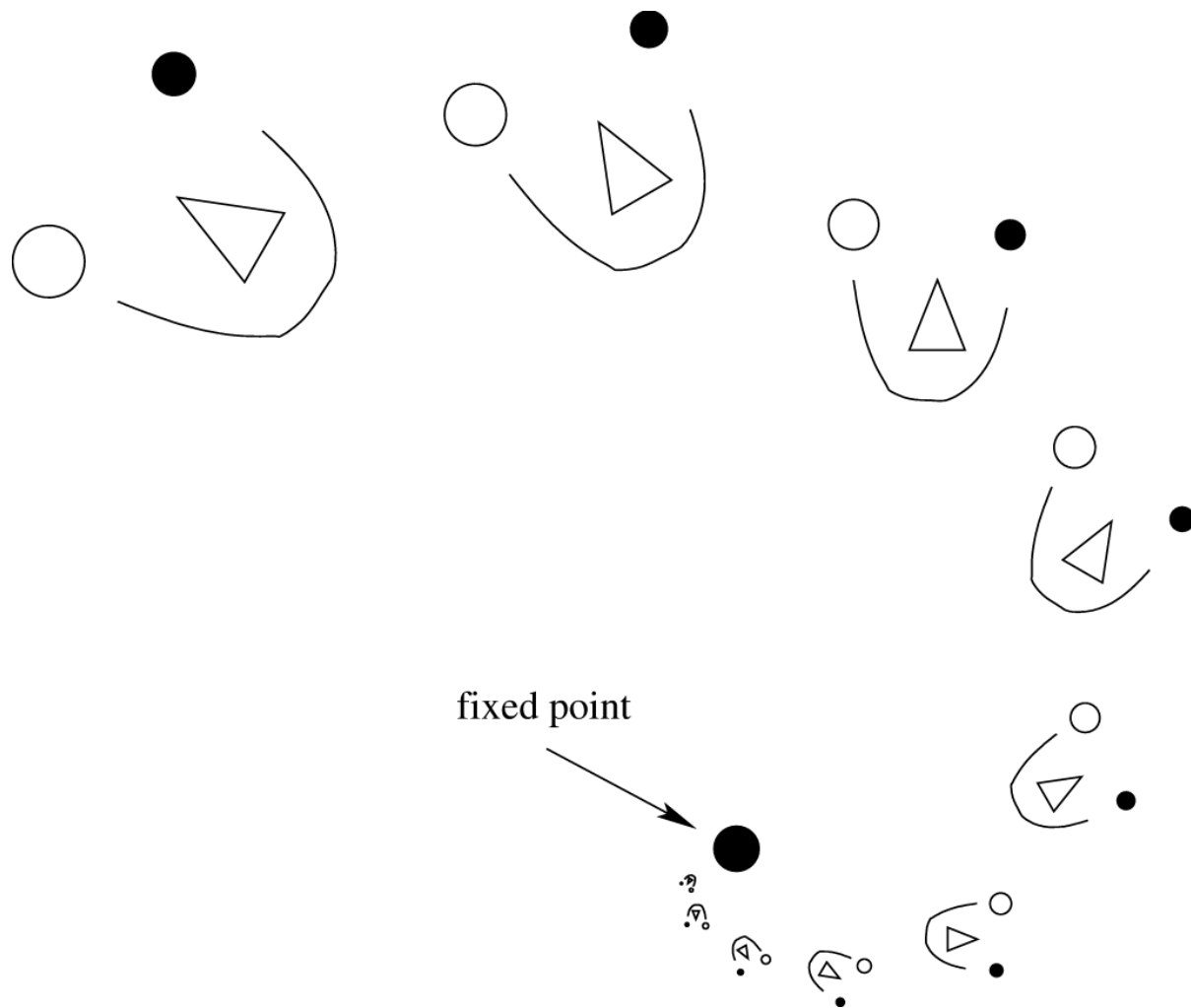


Fig 6.5

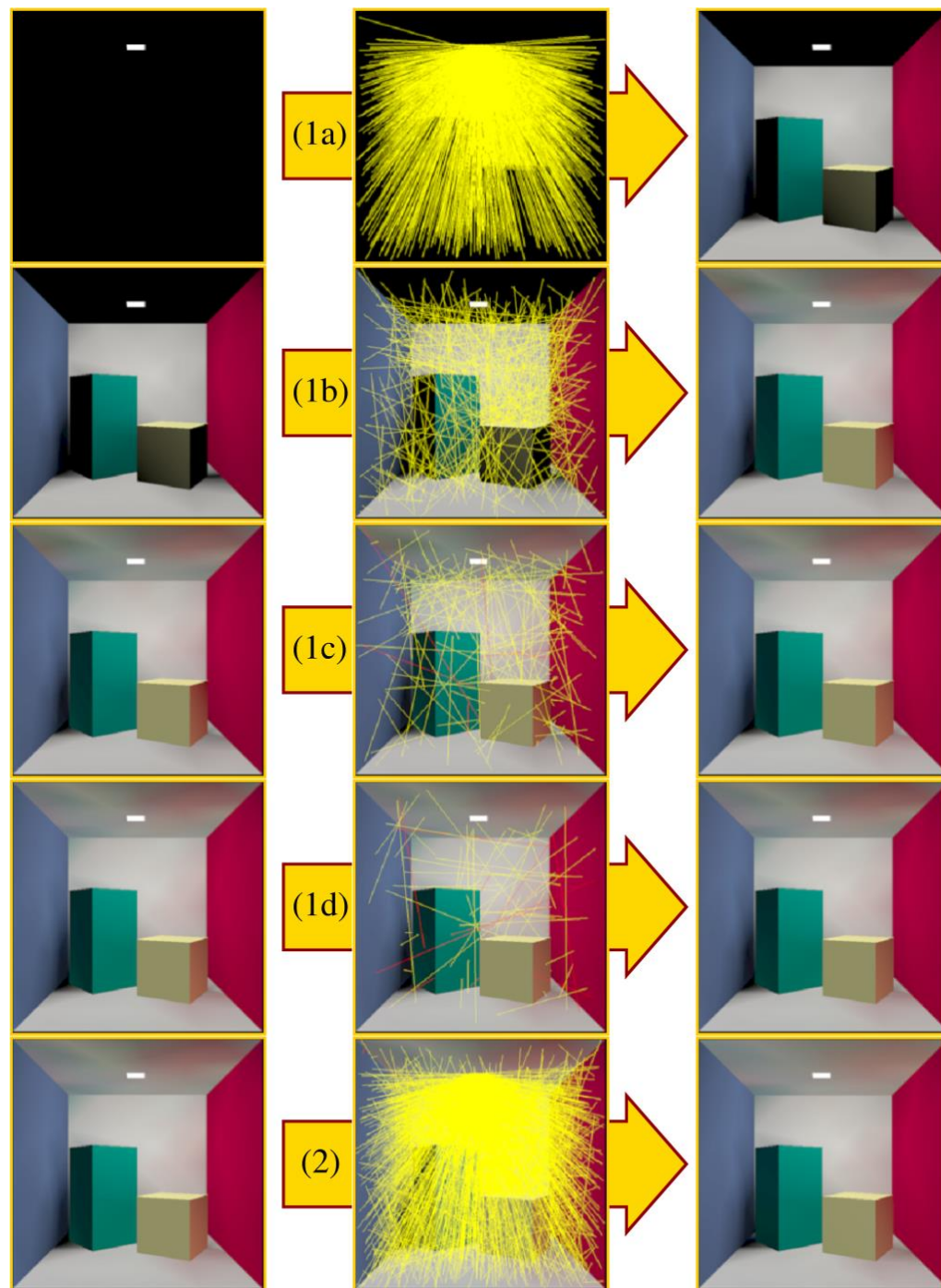


Fig 6.6



1 iteration



4 iterations



16 iterations

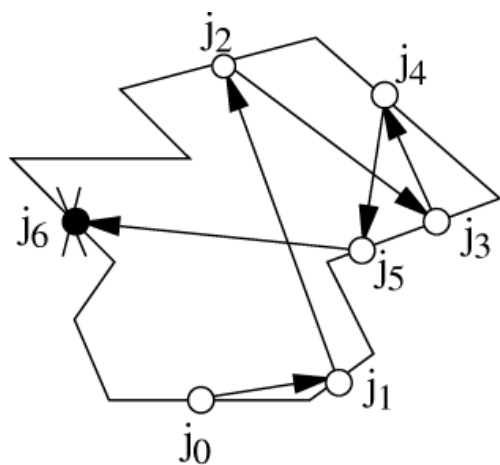


64 iterations

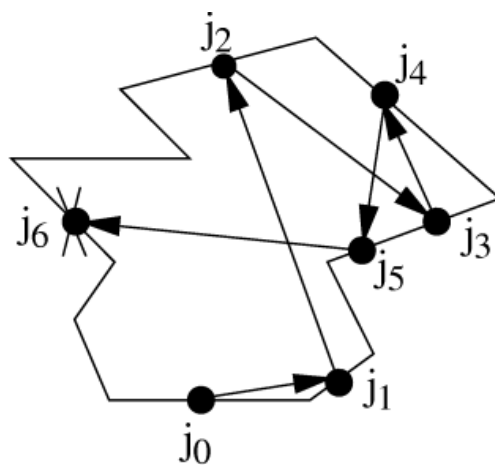


252 iterations

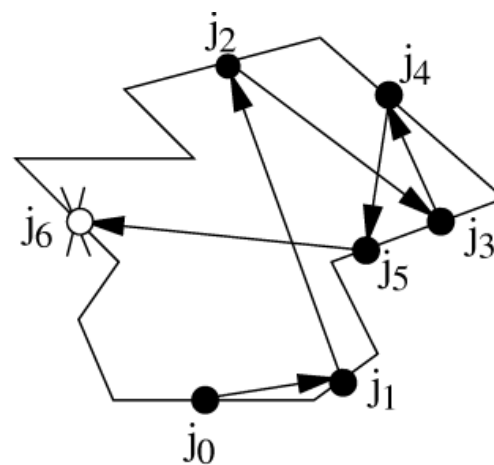
Fig 6.7



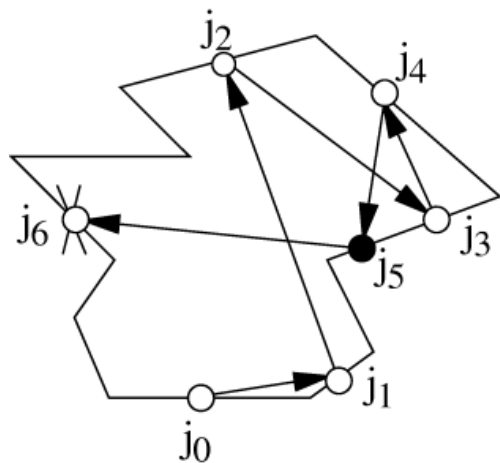
Absorption



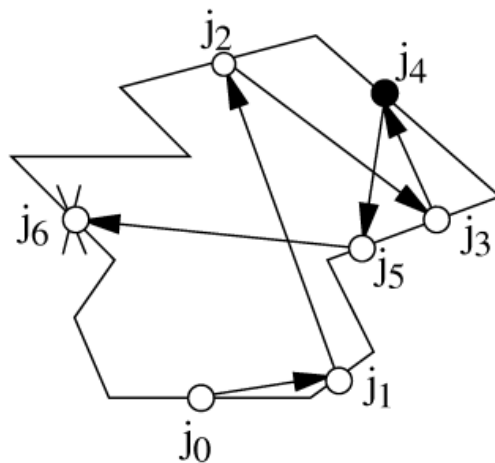
Collision



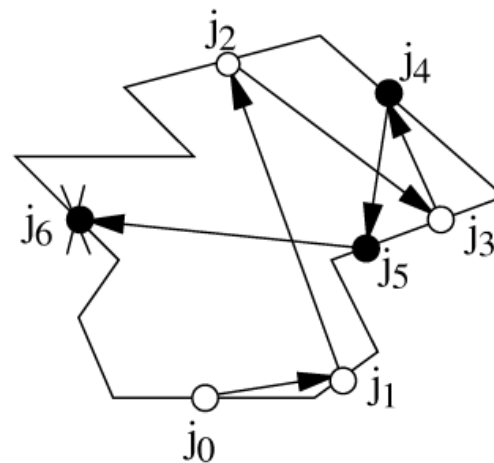
Survival



last but 1

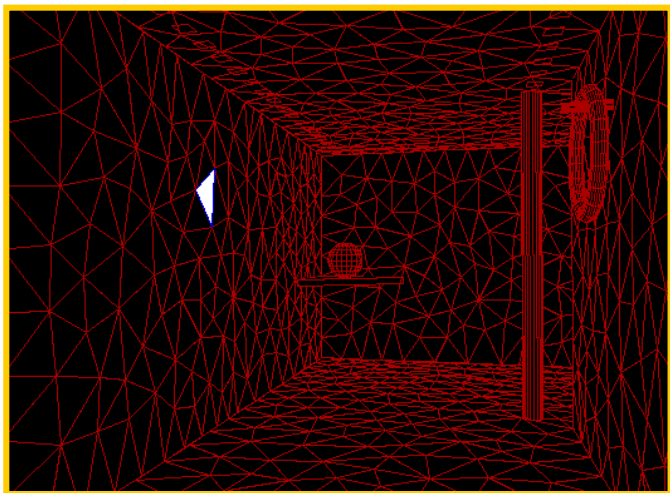
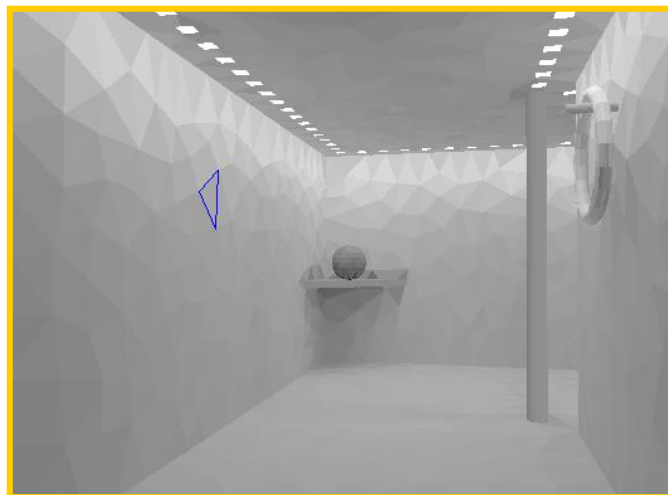


last but 2



all 3 last

Fig 6.8

V**B**

$$\langle V, B \rangle = \langle I, E \rangle$$

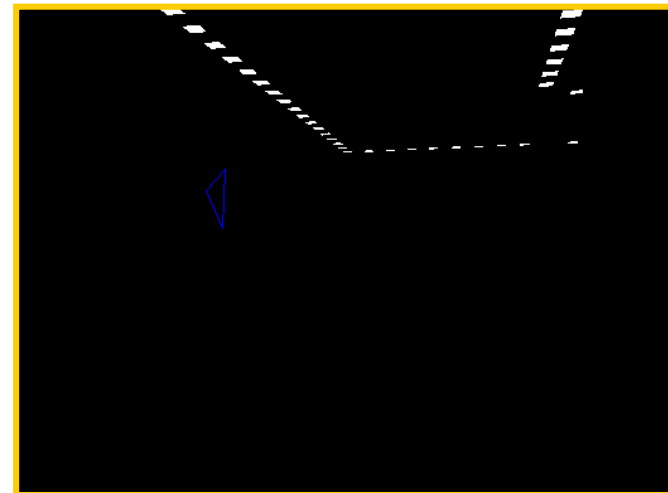
I**E**

Fig 6.9

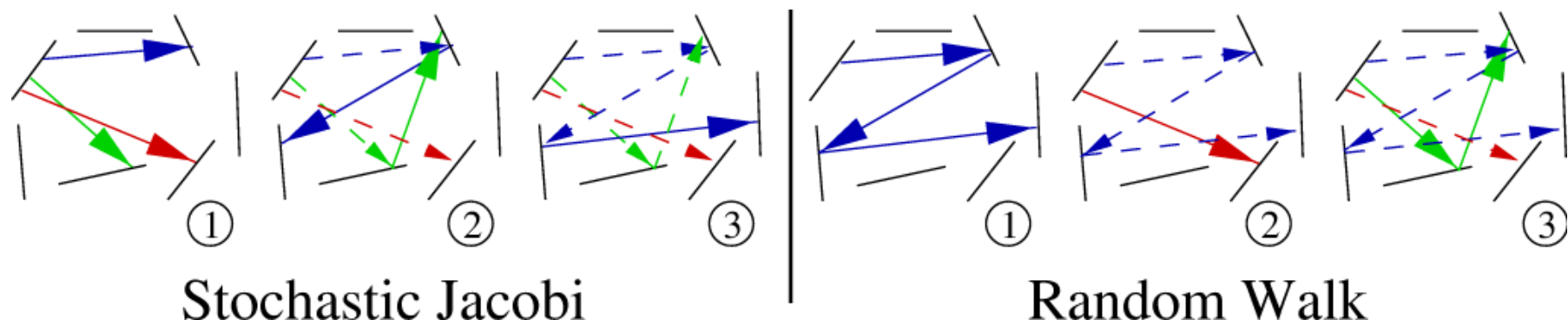


Fig 6.10

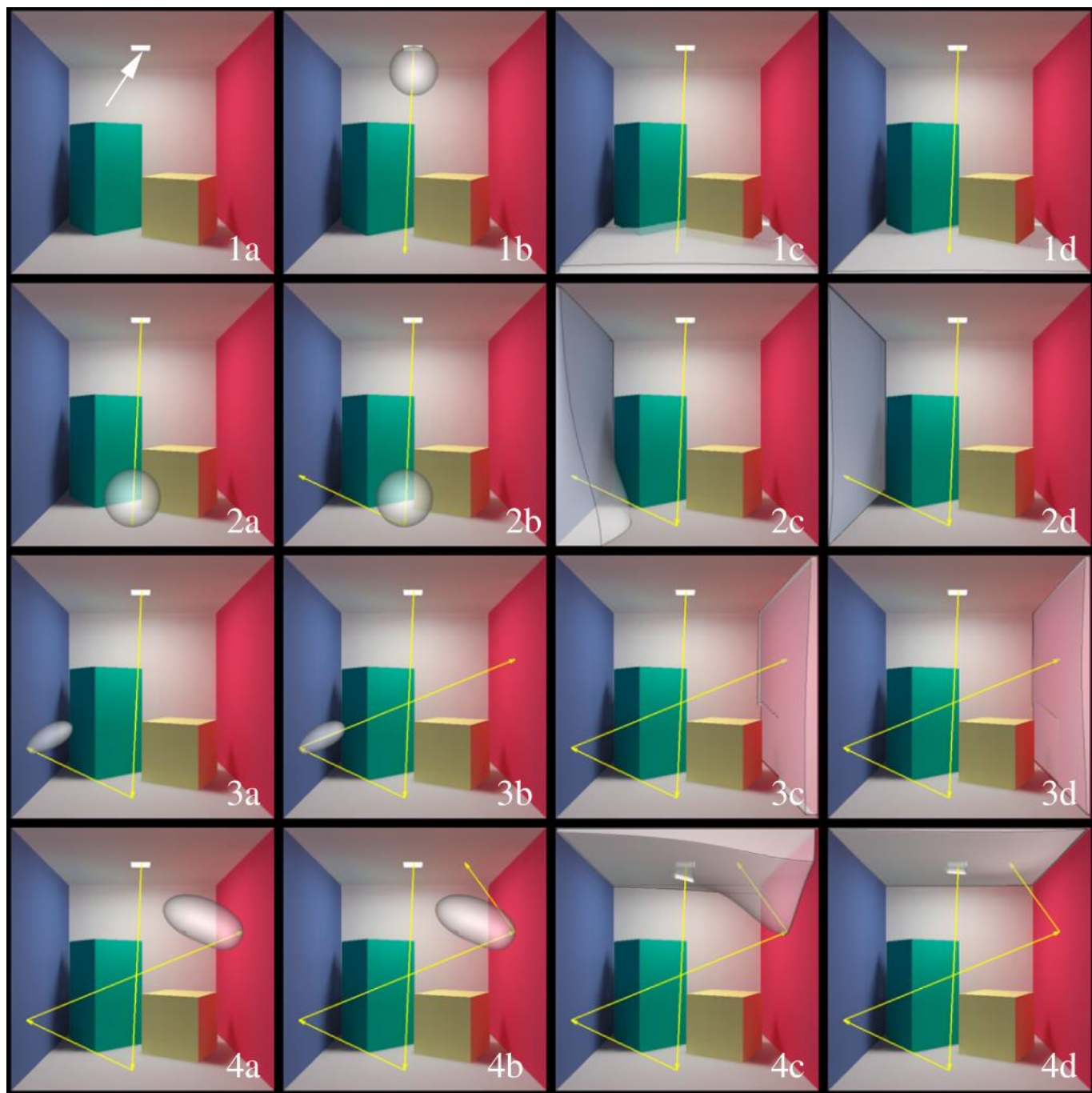
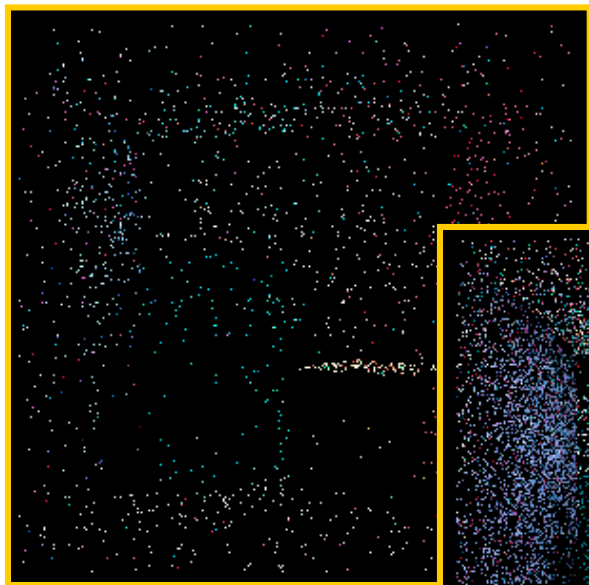
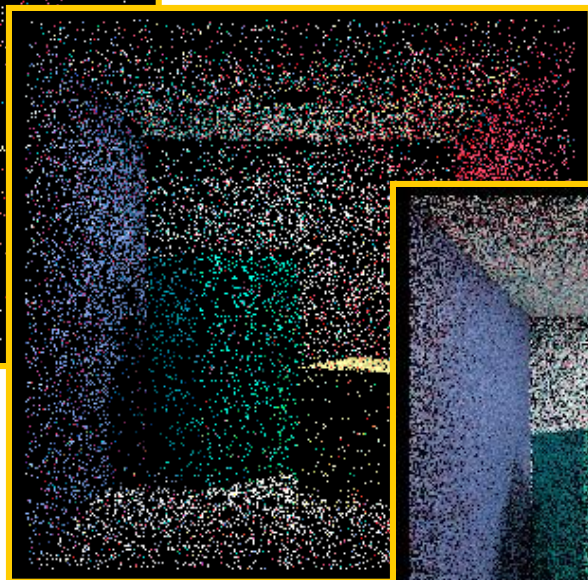


Fig 6.11



1,000 paths



10,000



100,000



1,000,000

Fig 6.12

Histogram method

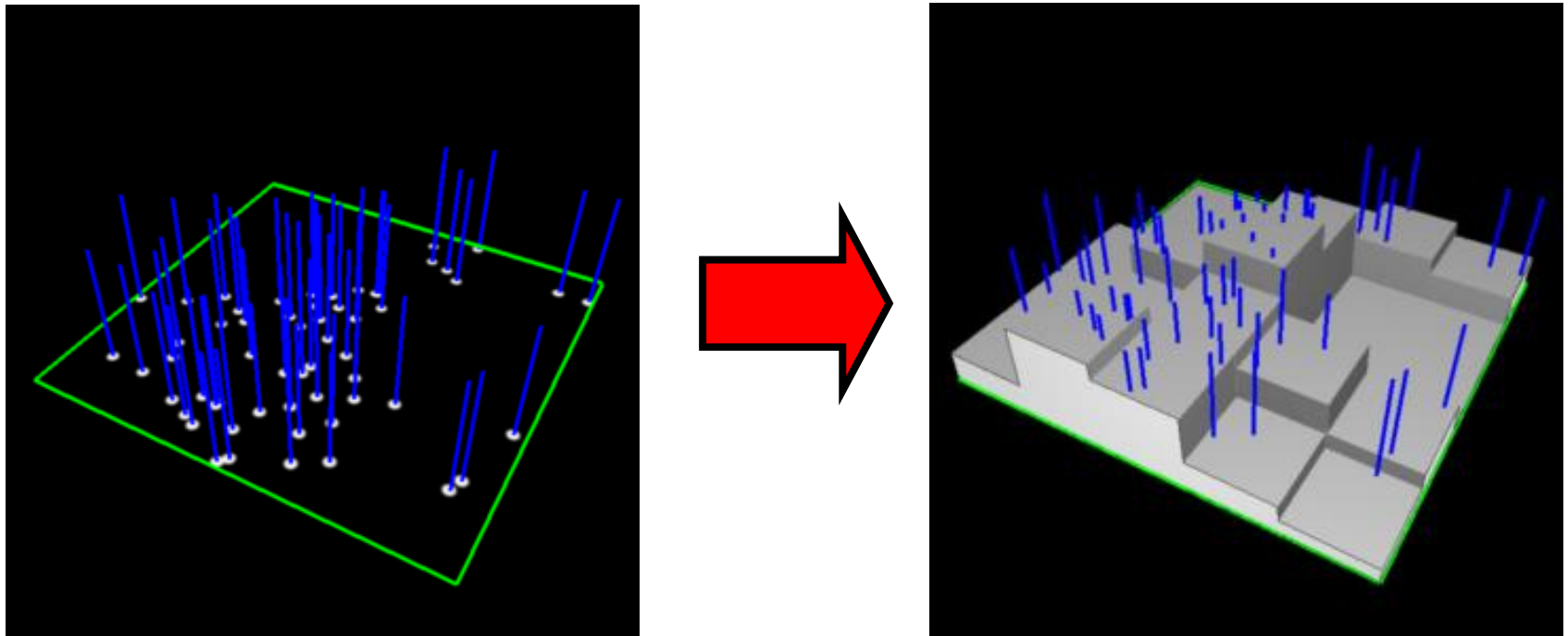


Fig 6.13a

Histogram method

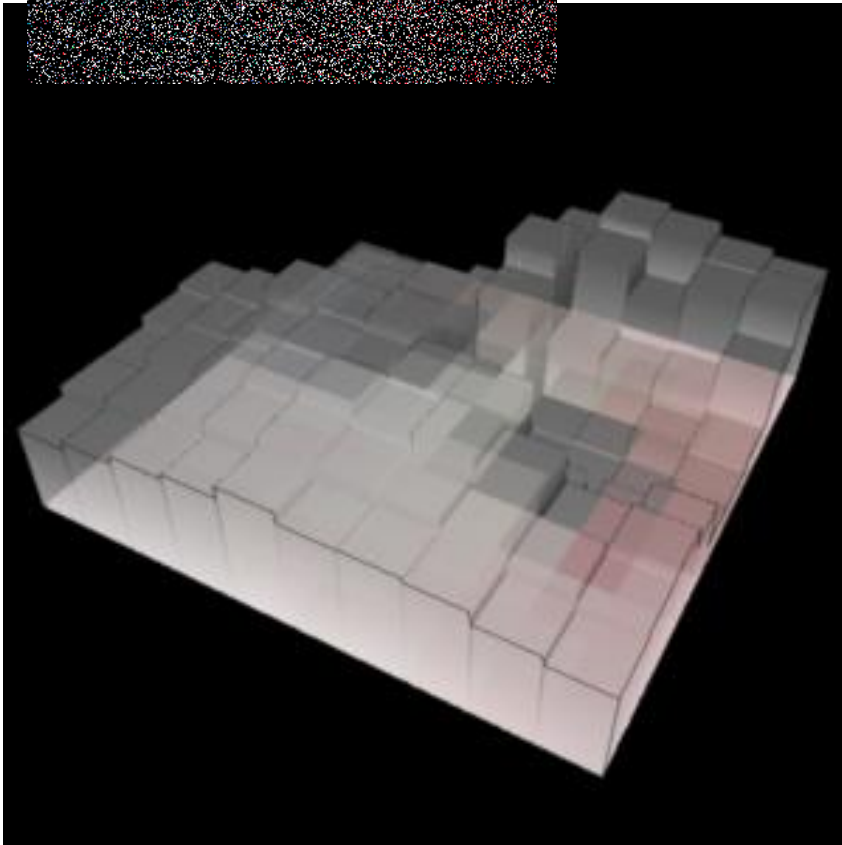
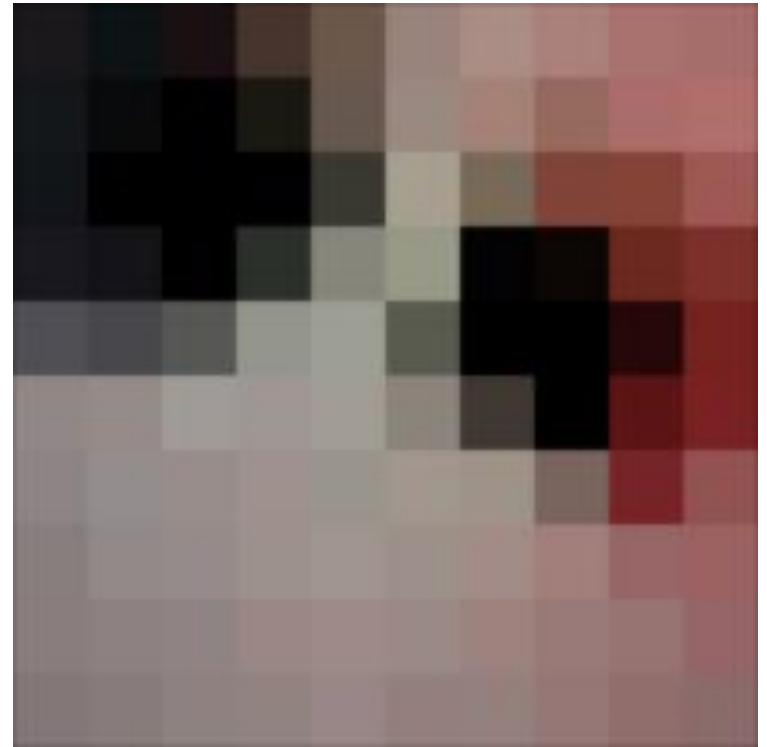
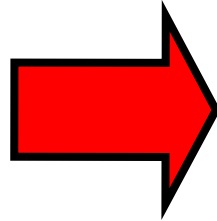
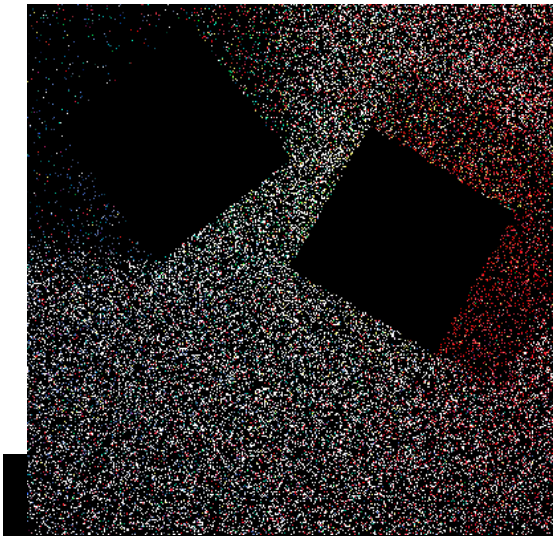


Fig 6.13b



Fig 6.14

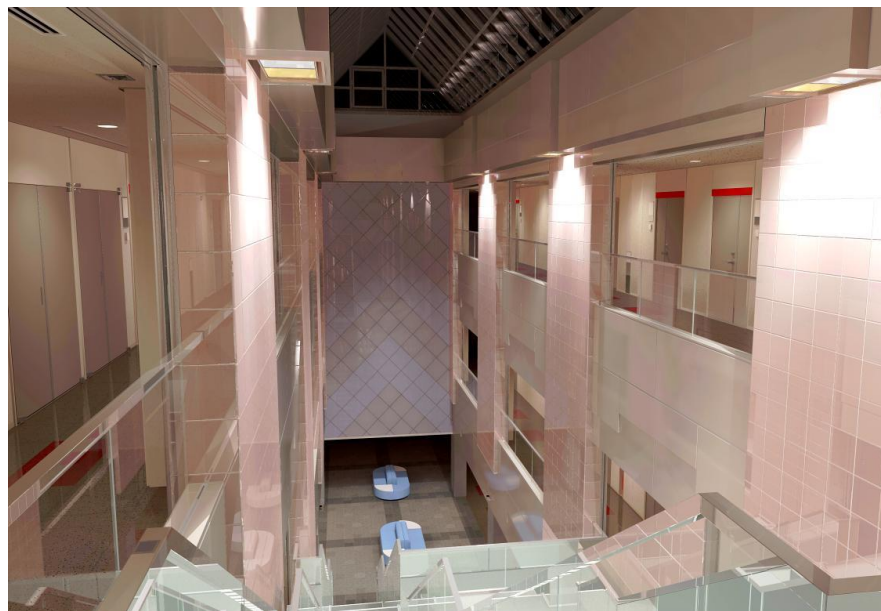


Fig 6.15

Quadrilaterals

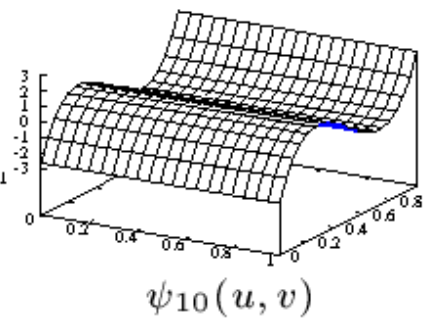
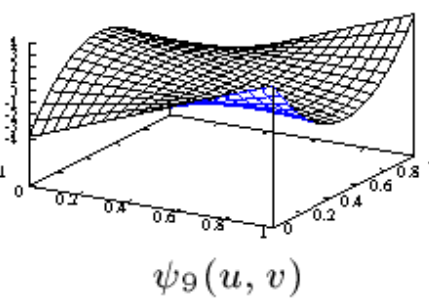
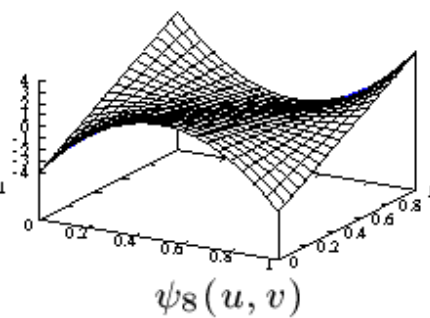
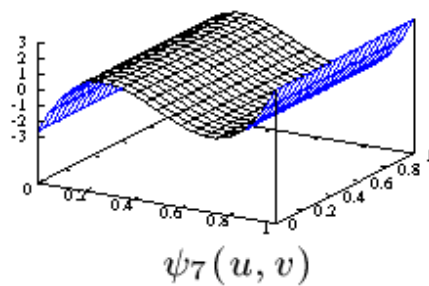
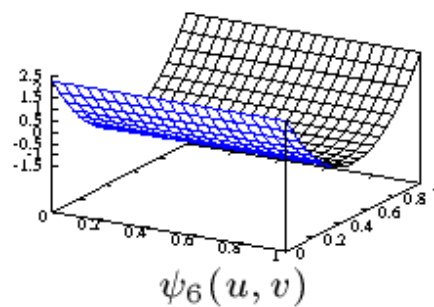
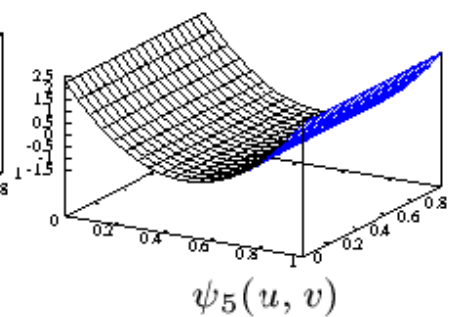
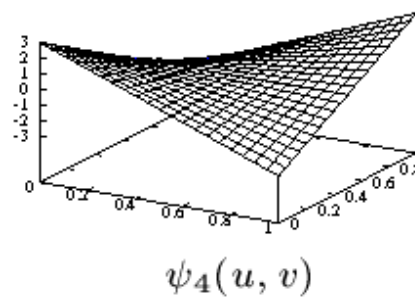
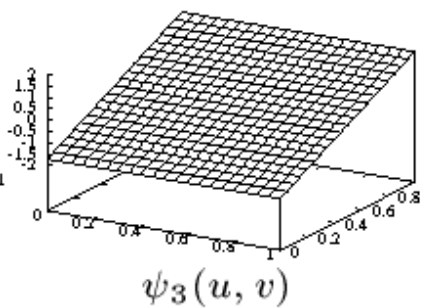
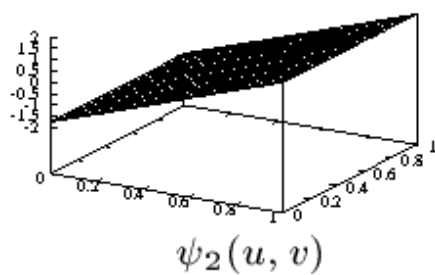
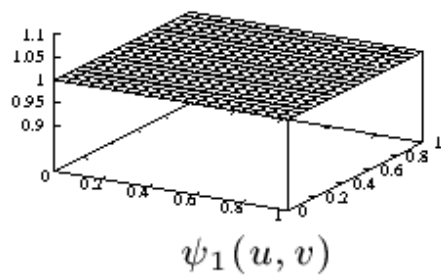
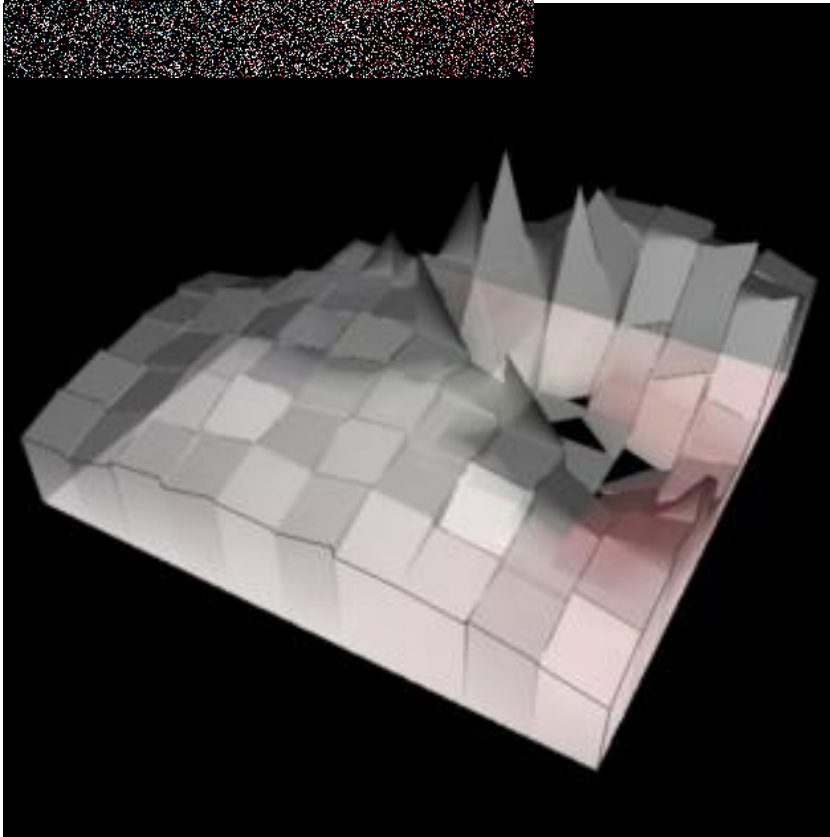
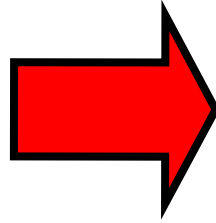
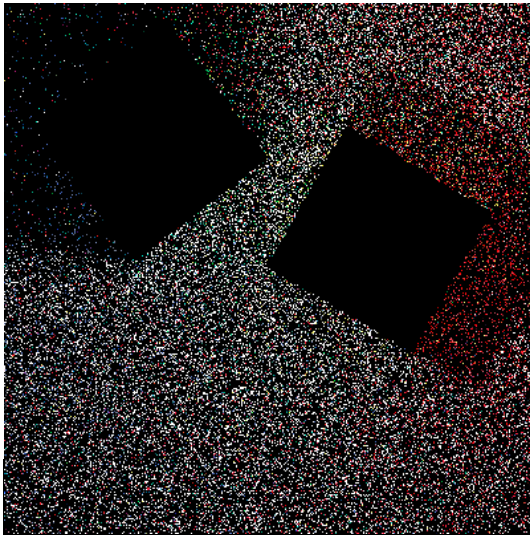


Fig 6.16a

Orthogonal Series



linear

Fig 6.16b

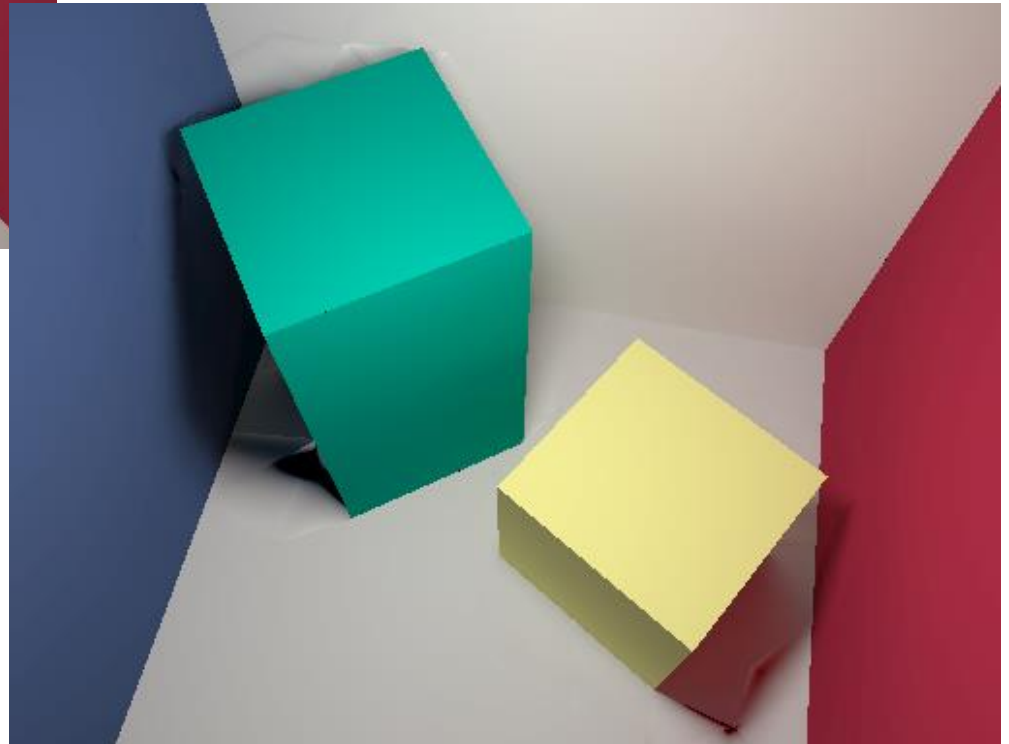
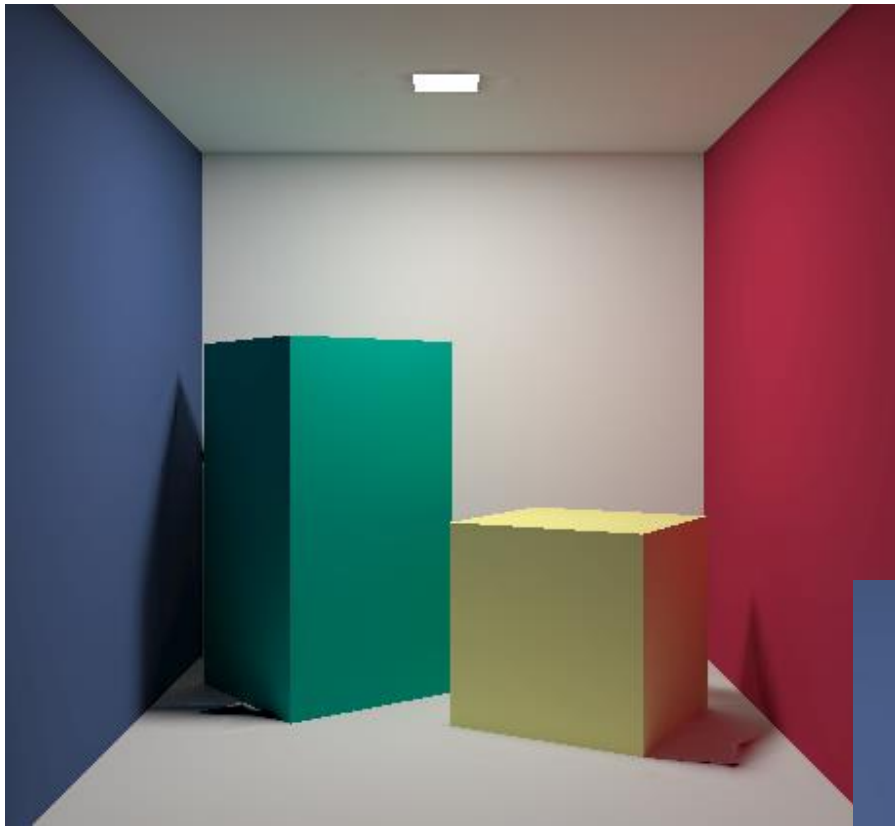


Fig 6.17

Kernel density estimation

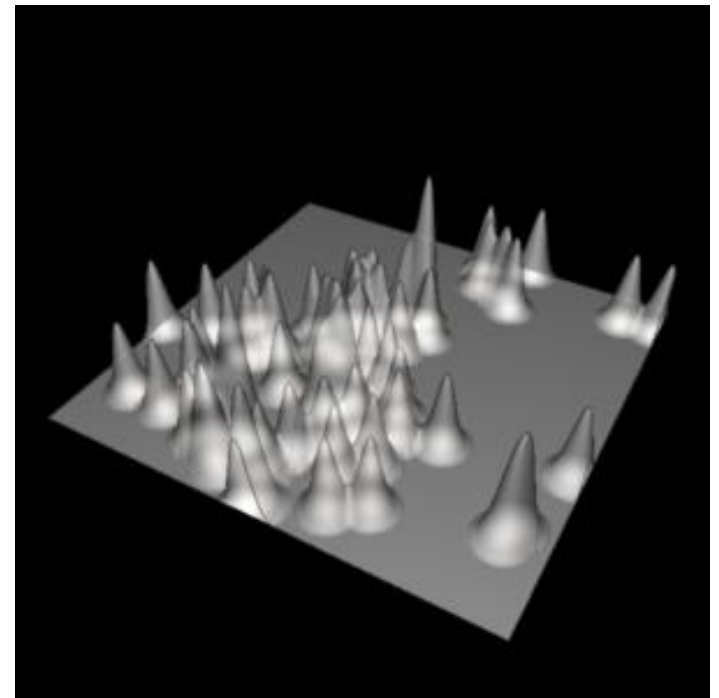
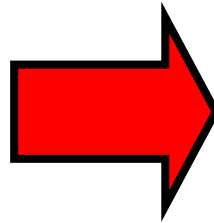
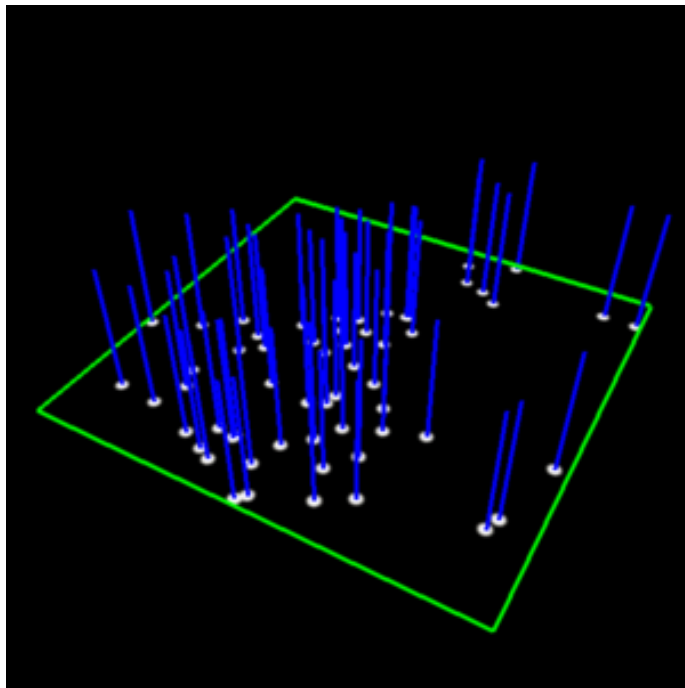


Fig 6.18a

Cylindrical kernel

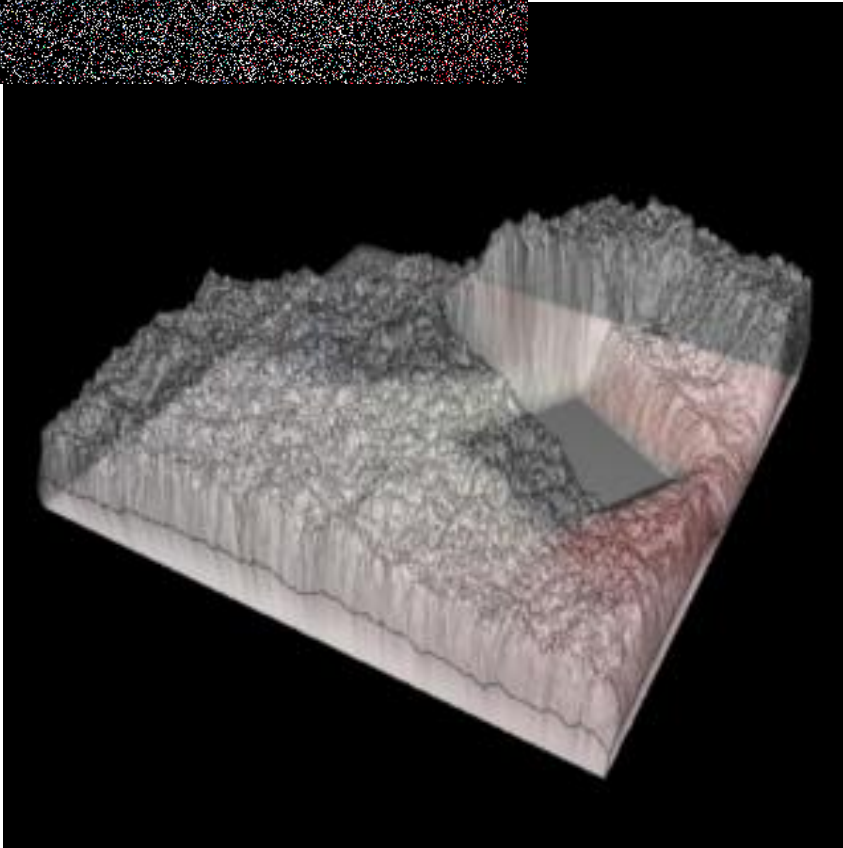
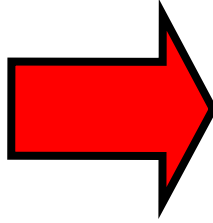
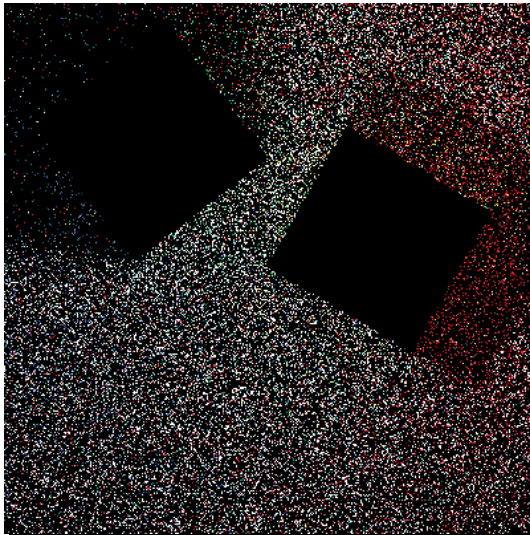


Fig 6.18b

Gaussian kernel

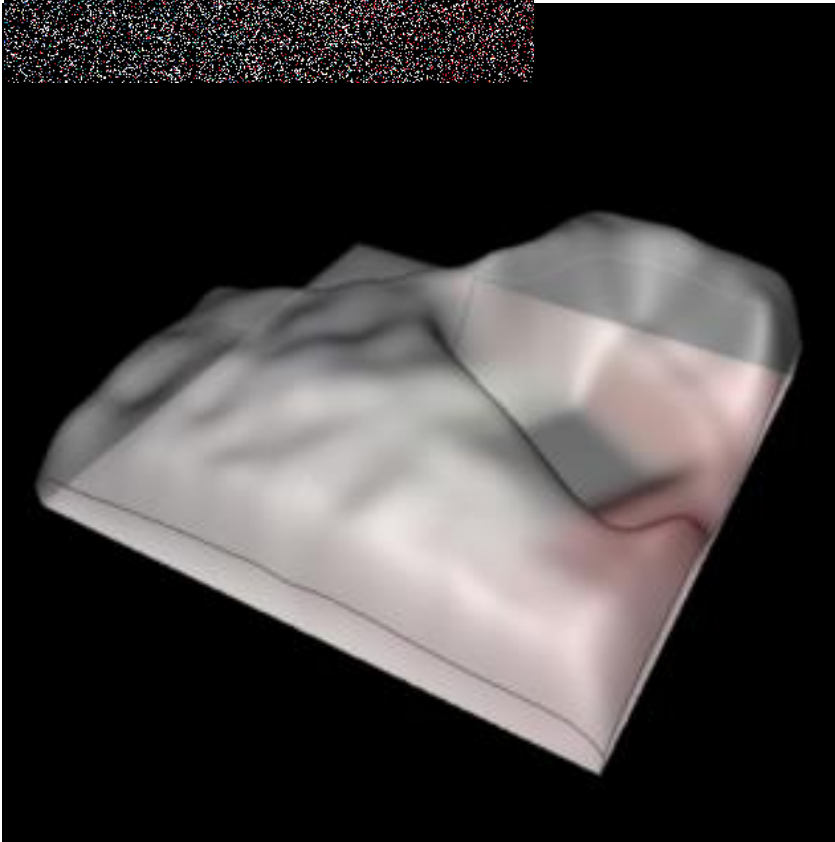
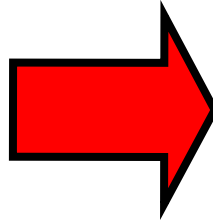
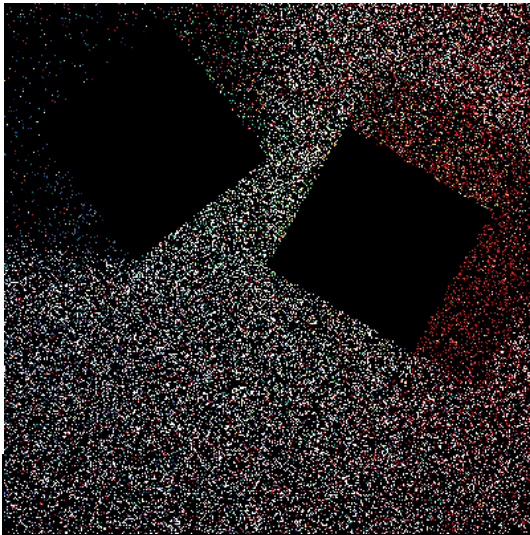


Fig 6.18c



Fig 6.19

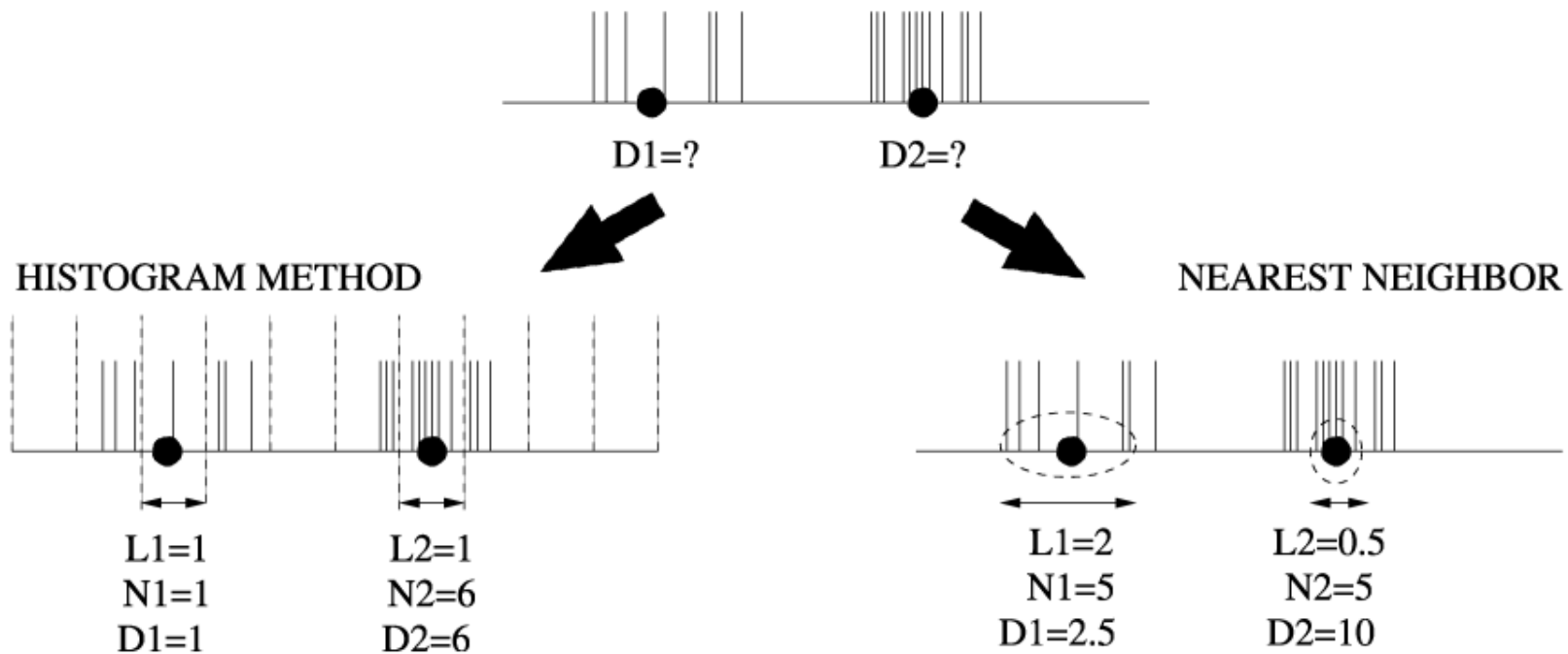
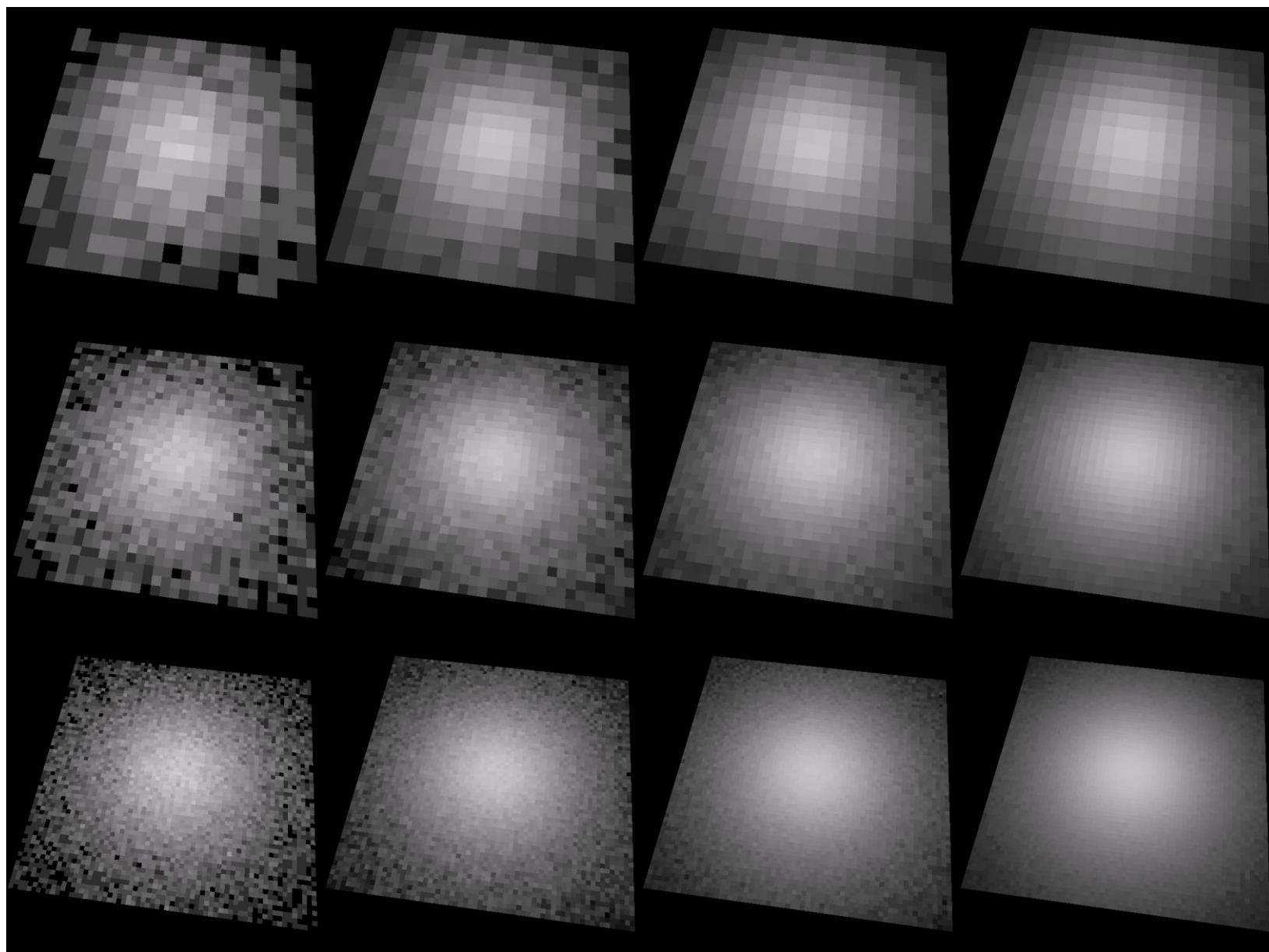


Fig 6.20

16^2 patches

32^2

64^2



10

40

160

640 rays per patch

Fig 6.21

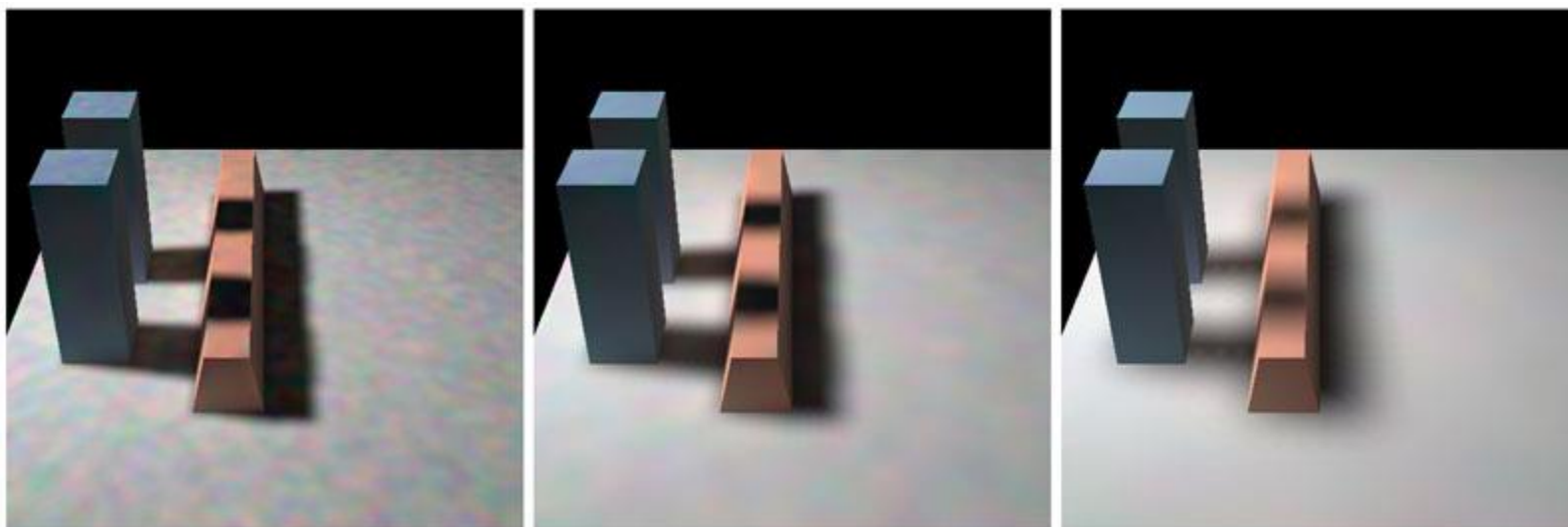
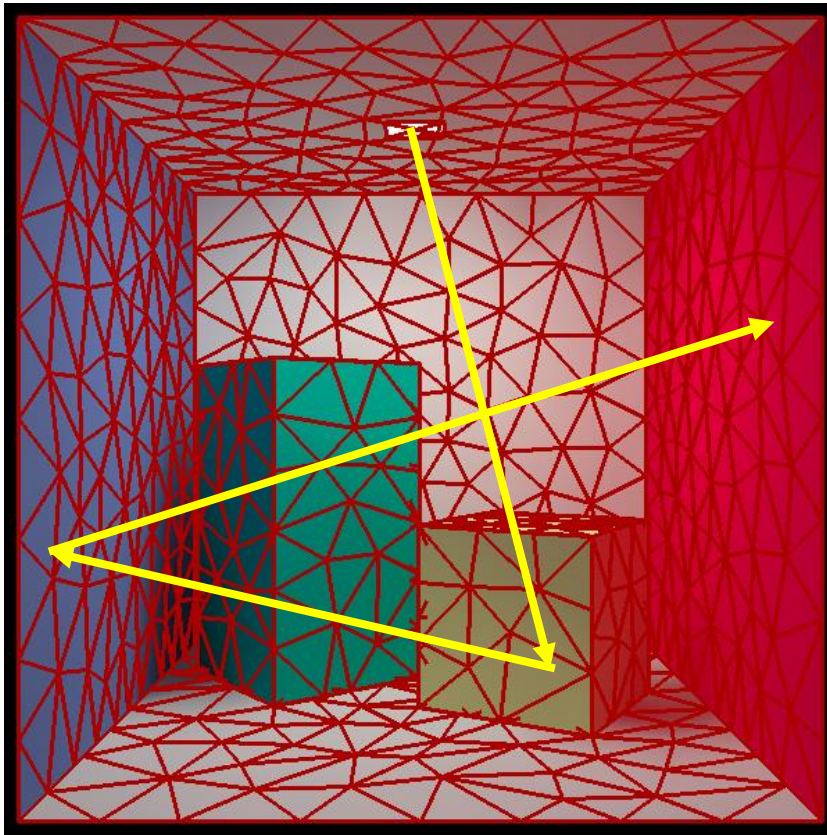
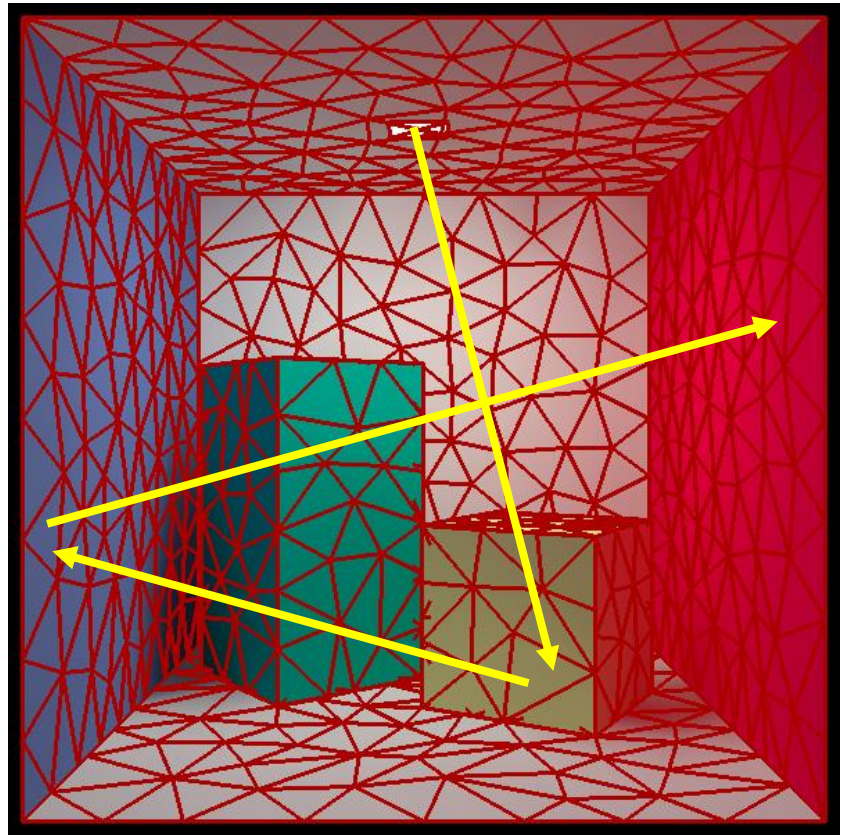


Fig 6.22



Continuous Random Walk



Discrete Random Walk

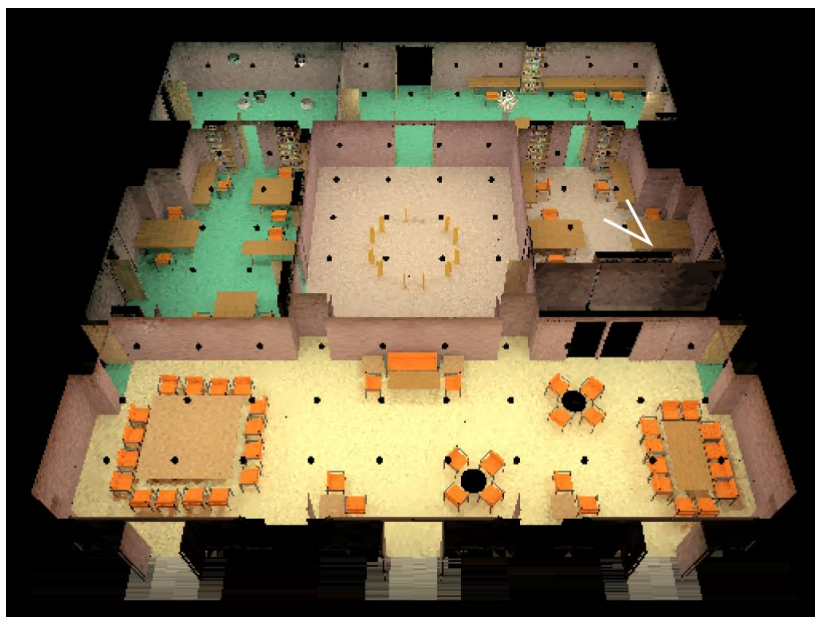


Fig 6.24

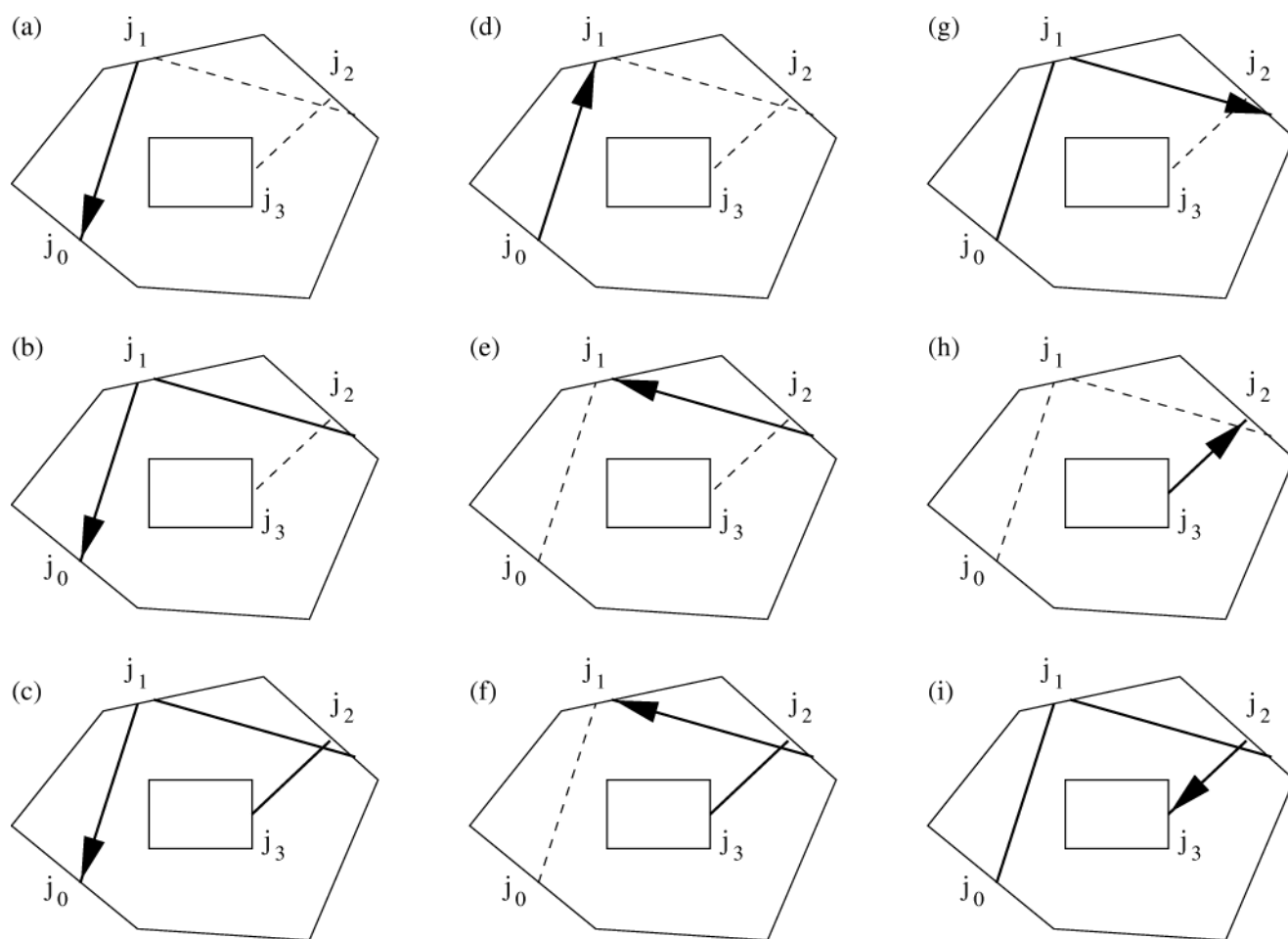


Fig 6.25



Fig 6.26

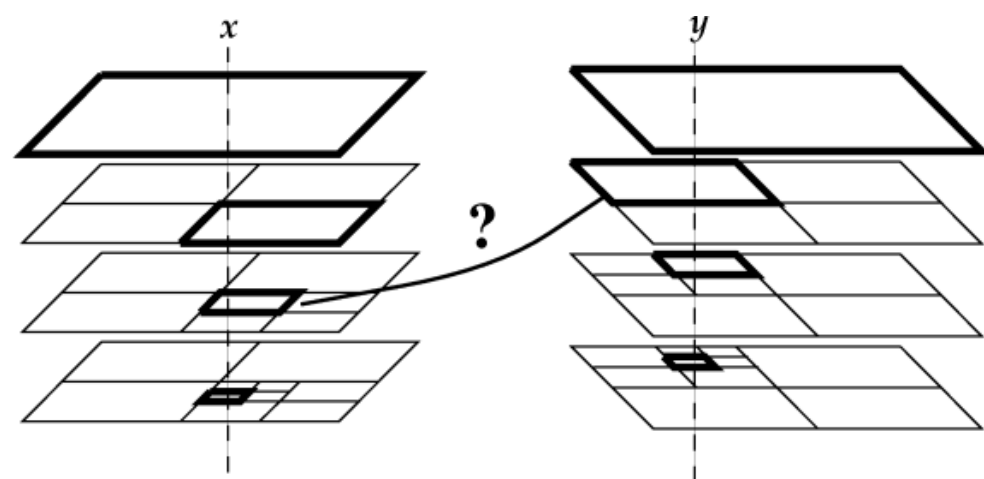
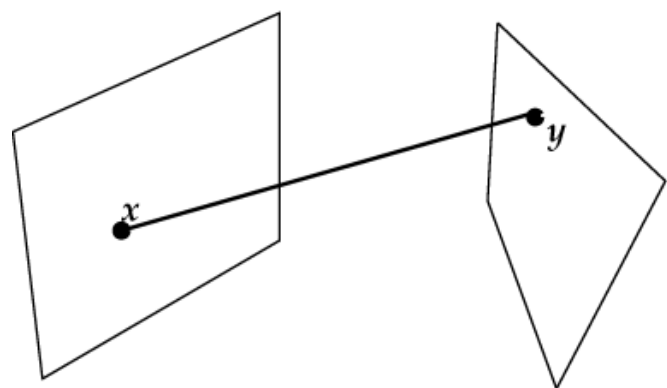


Fig 6.27

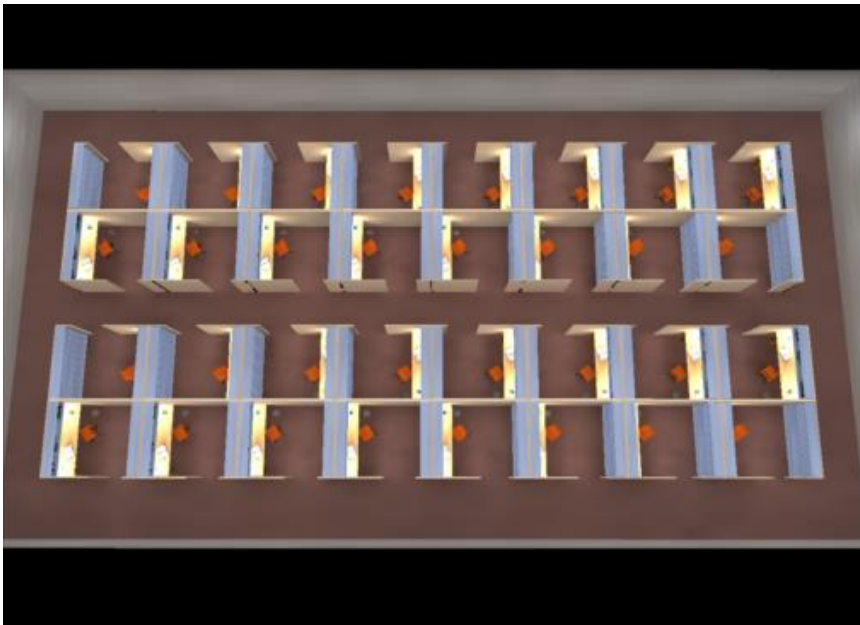


Fig 6.28