$$\overset{\text{follow distribution X of PDF } f(V_t)}{dV_t = V_t + \underbrace{W_t}_{\text{Brownian motion}} + \overbrace{\text{discontinuity}}} \tag{1}$$

(a) Stochastic Partial Differential Equation driving the system
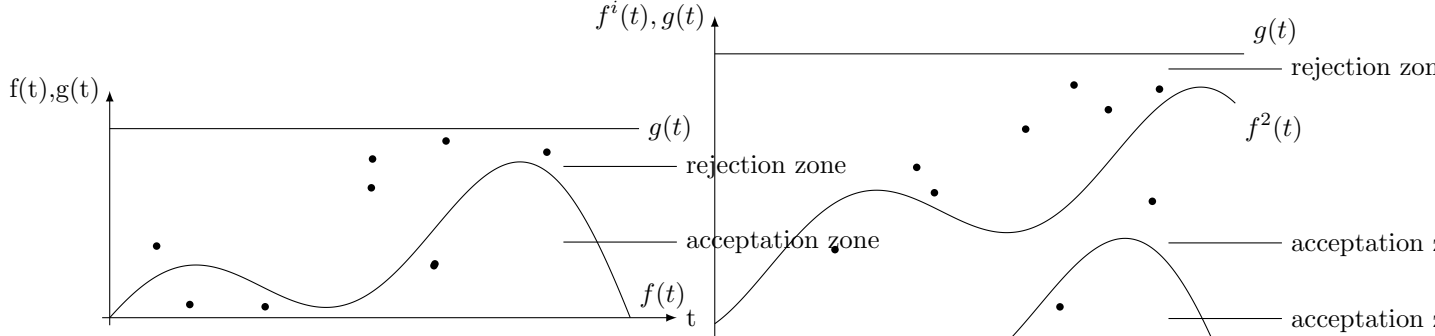
(b) Rejection sampling method for generating numbers following a target distribution X of PDF f using another (uniform) distribution Y of PDF g

(c) Rejection sampling method for generating numbers following a target distribution X of PDF f using another (uniform) distribution Y of PDF g
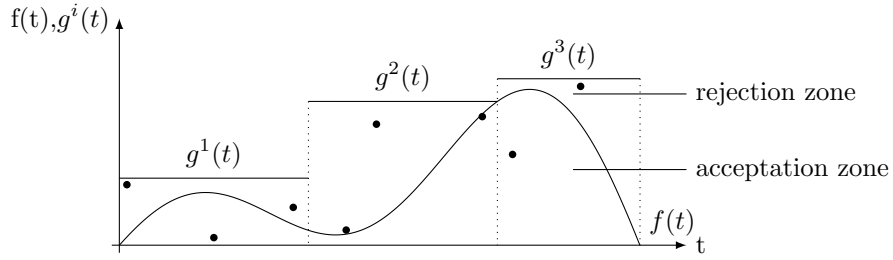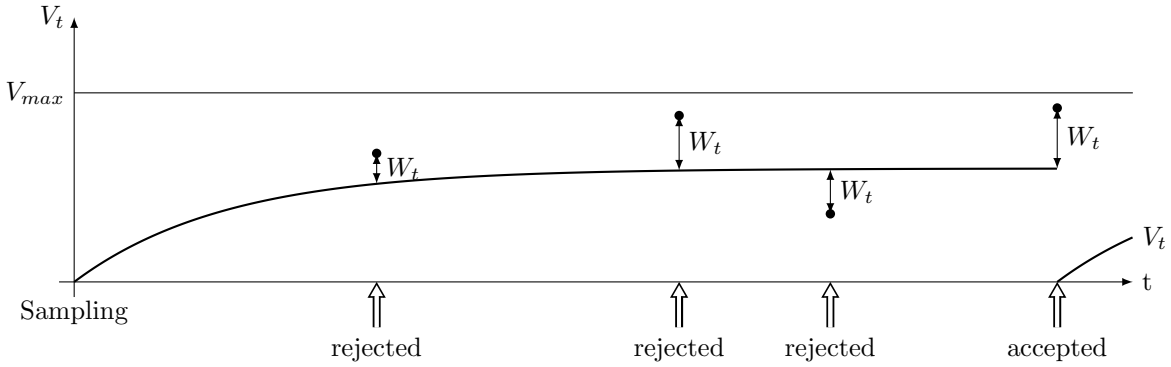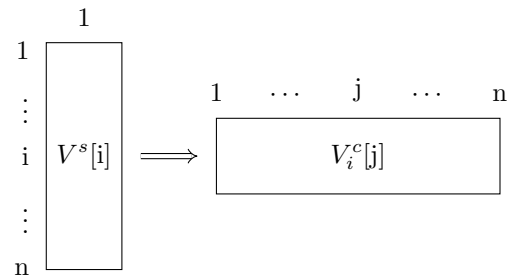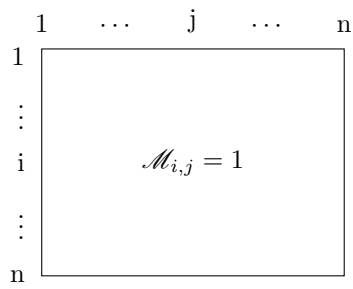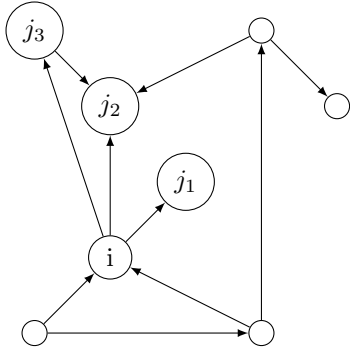

(d) Rejection sampling method for generating numbers following a target distribution X of PDF f using another (uniform) distribution Y of PDF g
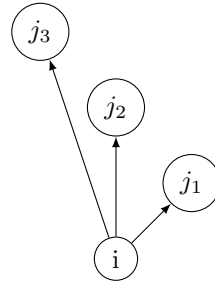

(e) Looking for discontinuities with rejection sampling method

(a) Matrix of children $\mathscr{M}_{i,j} = 1$ if j is children of i and 0 otherwise.

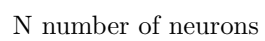(b) Vector of seeds and reconstructed vector of children

(c) Full network

(d) Only child of neuron i
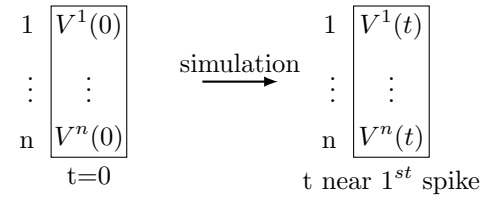
Figure 2: Algorithm for generating erdos-reynii graph in memory (a and c) and reconstructible (b and d)

N number of neurons

$$\mathbb{C}(cd) = \mathscr{O}(N^2) \tag{2}$$
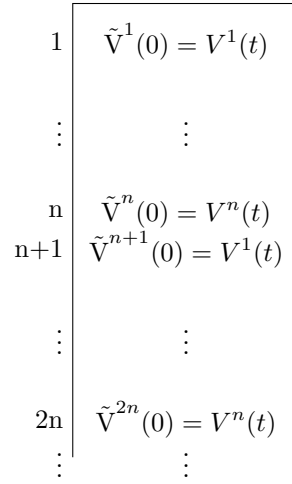$$\mathbb{C}(ed) = \mathscr{O}(N) \tag{3}$$

(a) Pre-simulation of a network of n neurons

(b) Using the values of potential from the pre-simulation for initializing the greater one

Figure 4: Initialization procedure

f(x),$\tilde{\mathrm{f}}^i(x)$

$\tilde{\mathrm{f}}^2(t)$

$\tilde{\mathrm{f}}^3(t)$

rejection zone

$\tilde{\mathrm{f}}^1(t)$

acceptation zone

$f(x)$
$x = V_t$

accepted

V_t

V_t
Unnoisy V_t

V_t

V_t
Unnoisy V_t

rejected

t

t

Choice of a new neuron

$f^i(t), g(t)$

$g(t)$

rejection zone

$f^2(t)$

acceptation zone of $f^2(t)$

acceptation zone of $f^1(t)$

$f^1(t)$
t

f(t)

f(t)

f(t)

f(t)

t

t

t

t