Method of Least Squares

Data : (x_i, y_i) $1 \leq i \leq n$

"$Y = w_1 X + w_2$ is the relation"

Find w_1 and w_2 so that :

$\sum_{i=1}^{n} (y_i - w_1 x_i - w_2)^2$ is Minimized

Solution

- differentiate
- normal Equations
- Can we Learn ?

Gradient Descent

Parameters :-

- Starting Point, w_0
- Step Size, ε
- Iterations, T

Algorithm

- $w(t+1) = w(t) - \varepsilon \nabla L(w(t))$
- stop at $t = T-1$
- take best $\tilde{w}$

How Low Can You Sink?

In Search of Global Minima

Vivek S Borkar

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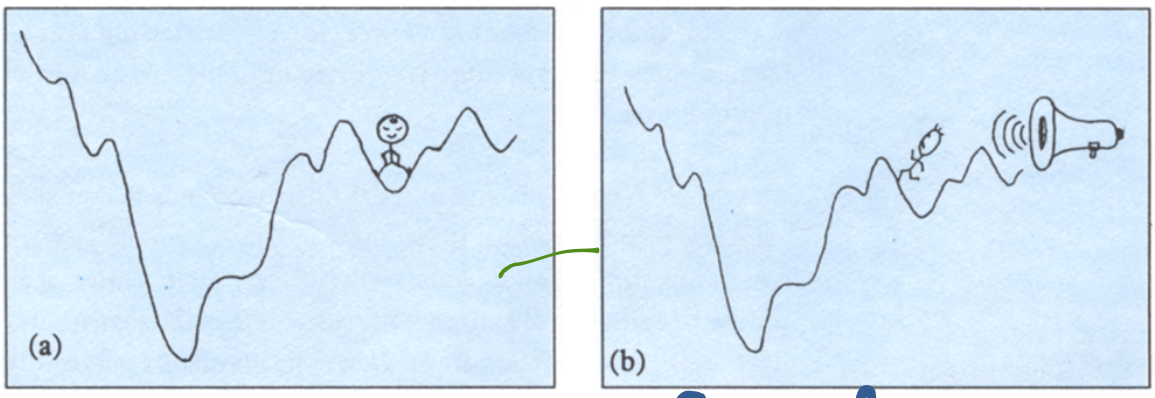
Many scientific and technological problems involve finding the lowest attainable value of a function. This article motivates, describes, and discusses one powerful computational strategy. It is called "simulated annealing" in analogy with the physical process of slowly cooling a system to take it to its ground state.

Getting to the Bottom of It

Vivek S. Borkar

Resonance

February 1997



Stochastic Gradient descent

$$w_{t+1} = w_t - \varepsilon\left(\nabla f(w_t) + \xi_t\right)$$