

Recovery Block

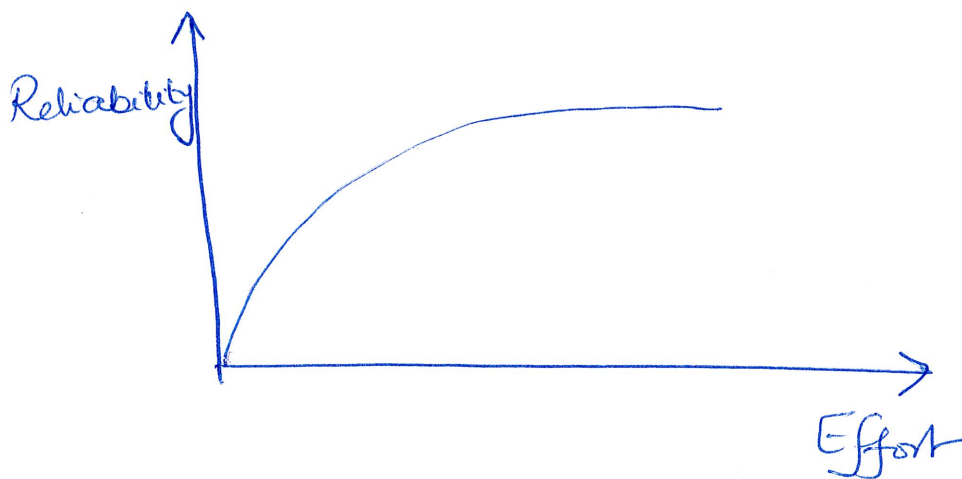
Acceptance Test should be easy to write

Example

Training in supervised learning
Factorization of large numbers
Sorting
Solving equations

Non-example

TSP
Unsupervised classification



$$\lambda R(t) \propto C$$

$$\lambda \propto \frac{1}{E}$$

$$\lambda = K \frac{C}{E}$$

Exponential

$$R(t) = e^{-\lambda t} = e^{-K \frac{C}{E} t}$$

Total budget = E
Complexity of each version = C

$$R_{NVP-3} = 3R^2 - 2R^3$$

$$R_{\text{each version}} = e^{-\frac{3C}{E} t}$$

$$= 3e^{-\frac{6Ct}{E}} - 2e^{-\frac{9Ct}{E}}$$

$$R(t) = e^{-\lambda t}$$

$$\lambda \propto C$$

$$\lambda \propto \frac{1}{E}$$

$$\therefore R(t) = e^{-\frac{Kct}{E}}$$

$$R_{NVP}(t) \quad N=3$$

$$R_{RB}(t) \quad N=3$$

$$R_{\text{simplex}}(t)$$

$$R_{\text{simplex}}(t) = e^{-\frac{Kct}{E}} \quad K=1$$

$$= e^{-\frac{ct}{E}}$$

$$R_{NVP}(t) = 3e^{-\frac{6Kct}{E}} - 2e^{-\frac{9Kct}{E}}$$

$$(N=3)$$

$$R_{RB}(t) = 1 - (1-R)^3 = 1 - \left(1 - e^{-\frac{6ct}{E}} - 2e^{-\frac{9ct}{E}} - 3e^{-\frac{12ct}{E}}\right)^3$$

$$(N=3)$$

NVP in practice

Proportionality constant

Version 1: $0.8E$

K_1

Version 2: $0.15E$

K_2

Version 3: $0.05E$

K_3

} legacy code that you upgrade for this mission

Typically

$$K_3 < K_2 < K_1$$



Give argument for using NVP.

Recovery Block

with 3 versions R_1 R_2 R_3

$$R_{RB-3} = 1 - (1 - R_1) \cdot (1 - R_2) \cdot (1 - R_3)$$

Ⓚ If we split budget equally

$$R_1 = R_2 = R_3 = e^{-\frac{3C}{E}t}$$