

11/20 A1. Boosting

ADABOOST

STRONG

WEAK

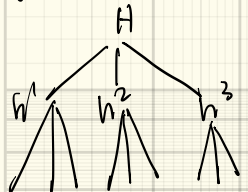


PICK h^1 TO MIN ERROR

PICK h^2 WITH EMPHASIS ON h^1 ERRORS

PICK h^3 WITH EMPHASIS ON $h^1 \neq h^2$

GET OUT THE VOTE



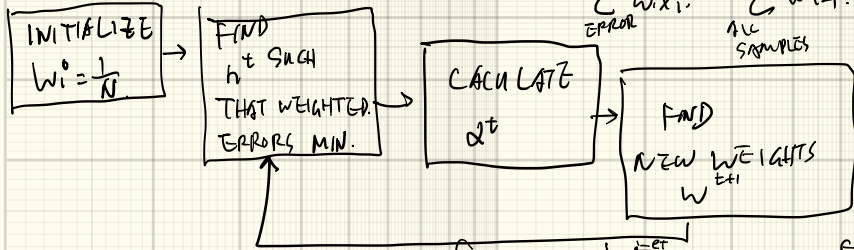
ID TREE
STUMP



ADA BOOST
PINE

$$H(x) = \text{sign}(w^1 h^1(x) + \dots + w^N h^N(x))$$

$$\sum_{\text{ERROR}} w_i x_i, \quad \sum_{\text{ALL SAMPLES}} w_i = 1, \quad w^0 = \frac{1}{N}$$



$$w_i^{t+1} = \frac{w_i^t}{Z} e^{-\alpha^t h^t(x_i) y(x_i)}$$

EXPONENTIAL BOUND ON OVERALL H IF Z MINIMIZED.

$$\alpha = \frac{1}{2} \ln \frac{1 - \epsilon^t}{\epsilon^t}$$

$$\frac{w_i}{Z} e^{-\frac{1}{2} \ln \frac{1 - \epsilon^t}{\epsilon^t}} = \frac{w_i}{Z} e^{-\frac{1}{2} \ln \frac{\epsilon^t}{1 - \epsilon^t}}$$

IF CORRECT.

$$\frac{w_i}{Z} e^{\frac{1}{2} \ln \frac{1 - \epsilon^t}{\epsilon^t}}$$

IF NOT CORRECT

