Confidence-Rated Predictions

[with Singer]

- useful to allow weak classifiers to assign confidences to predictions
- formally, allow $h_t : X \to \mathbb{R}$

$$\begin{aligned} \text{sign}(h_t(x)) &= \text{prediction} \\ |h_t(x)| &= \text{``confidence''} \end{aligned}$$

- use identical update:

$$D_{t+1}(i) = \frac{D_t(i)}{Z_t} \cdot \exp(-\alpha_t \, y_i \, h_t(x_i))$$

  and identical rule for combining weak classifiers
- question: how to choose α_t and h_t on each round