

## The Hedge( $\eta$ ) Algorithm

Consider action  $i$  at time  $t$

- ▶ Total loss:

$$L_i^t = \sum_{s=1}^{t-1} \ell_i^s$$

- ▶ Weight:

$$w_i^t = w_i^1 e^{-\eta L_i^t}$$

Note freedom to choose initial weight ( $w_i^1$ )  $\sum_{i=1}^n w_i^1 = 1$ .

- ▶  $\eta > 0$  is the learning rate parameter. Halving:  $\eta \rightarrow \infty$