## Cumulative loss vs. Final total weight

Total weight: 
$$W^t \doteq \sum_{i=1}^N w_i^t$$

$$W^{t+1} \qquad \sum_{i=1}^N w_i^t e^{\log p_i^t(c^t)} e^{\log p_i^t(c^t)} \qquad \sum_{i=1}^N w_i^t e^{\log p_i^t(c^t)} e^{\log p_i^t(c^t)$$

$$\frac{W^{t+1}}{W^t} = \frac{\sum_{i=1}^{N} w_i^t e^{\log \rho_i^t(c^t)}}{\sum_{i=1}^{N} w_i^t} = \frac{\sum_{i=1}^{N} w_i^t \rho_i^t(c^t)}{\sum_{i=1}^{N} w_i^t} = \rho_A^t(c^t)$$
$$-\log \frac{W^{t+1}}{W^t} = -\log \rho_A^t(c^t)$$

$$-\log \frac{W^{T+1}}{W^1} = -\sum_{t=1}^{T} \log p_A^t(c^t) = L_A^T$$