

$$h(w) = -\frac{1}{N} \left[\sum_{i=1}^N y_i \cdot \log \left(\frac{1}{1 + \exp(-(\vec{w}; \vec{x}_i))} \right) + (1 - y_i) \log \left(1 + \frac{1}{\exp(-\vec{x}_i; \vec{w})} \right) \right] + \frac{1}{C} \sum_{i=1}^N \vec{w}_i^2$$

Q - кон-во прыгнжков.

$$h(w) = \frac{1}{N} \sum_{i=1}^N y_i \log(1 + \exp(-\vec{w}; \vec{x}_i)) + (1 - y_i) \log(1 + \exp(\vec{w}; \vec{x}_i)) + \frac{1}{C} (\vec{w}; \vec{w})$$

$$\nabla h(w) = \frac{1}{N} \sum_{i=1}^N y_i \frac{\exp(-\vec{w}; \vec{x}_i)}{1 + \exp(-\vec{w}; \vec{x}_i)} (-\vec{x}_i) + (1 - y_i) \frac{\exp(\vec{w}; \vec{x}_i) \cdot \vec{x}_i}{1 + \exp(\vec{w}; \vec{x}_i)} + \frac{1}{C} \cdot 2\vec{w}.$$

$$\nabla h(w) = \frac{1}{N} \sum_{i=1}^N y_i \frac{-\vec{x}_i}{1 + \exp(\vec{w}; \vec{x}_i)} + (1 - y_i) \vec{x}_i \frac{1}{1 + \exp(-\vec{w}; \vec{x}_i)} + \frac{2}{C} \vec{w}.$$

$$\vec{w}_{new} = \vec{w}_{old} + \frac{\alpha}{n} \sum_{i=1}^n (y_i \cdot (1 - Q(\vec{x}_i)) \vec{x}_i + (1 - y_i) (0 - Q(\vec{x}_i)) \vec{x}_i) =$$

$$= \left(1 - \frac{2}{C}\right) \vec{w}_{old} + (y_i \vec{x}_i - Q(\vec{x}_i) y_i \vec{x}_i + Q(\vec{x}_i) \vec{x}_i + y_i Q(\vec{x}_i) \vec{x}_i) =$$

$$= \left(1 - \frac{2}{C}\right) \vec{w}_{old} + [y_i - Q(\vec{x}_i)] \vec{x}_i.$$