CLAPP – Representation Learning!

$$L_{clapp}^{t,\ell} = \max\left(0,\ 1 - y^t \cdot u_t^{t+\delta t,\ell}\right)$$

(ℓ: layer)

$$u_t = \vec{z}^{\,t+\delta t,\ell}\ W^{pred,\ell} \cdot \vec{c}^{\,t,\ell} \quad \text{(scalar!)}$$

($W^{pred,\ell}$: matrix)

$$z_i^t = g\left(\vec{w}_i^{\,T} \cdot \vec{z}^{\,t,\ell-1}\right)$$

$$= g\left(\sum_j w_{ij}^{\ell} \cdot z_j^{t,\ell-1}\right)$$

$$\frac{dL}{\partial w_{ij}^{\ell}} = \frac{\partial L^{t,\ell}}{\partial u_t^{t+\delta t,\ell}} \cdot \frac{\partial u_t^{t+\delta t,\ell}}{\partial w_{ij}^{\ell}}$$

if nonzero

$$\Delta w_{ij} = \eta \cdot (\dots + y^t \cdot g'(\ ) \cdot z_j^{t,\ell-1} \cdot \left[W^{pred,\ell} \cdot \vec{c}^{\,t,\ell}\right]_i$$

$[\ldots]_i$: lat_i = input to neuron i

$$lat_i = \sum_{k'} W_{ik'}^{pred}\, c_{k'}$$