Algorithm 4 BCFW for Structural SVM

Let $\boldsymbol{w}^{(0)} := \boldsymbol{w}_i{}^{(0)} := \mathbf{0}$

for $k = 0 \dots K$ **do**

Pick $i \in_{u.a.r.} [n]$

Solve $\boldsymbol{y}_i^* := \underset{\boldsymbol{y} \in \mathcal{Y}_i}{\operatorname{argmax}} \; H_i(\boldsymbol{y}; \boldsymbol{w}^{(k)})$

Let $\boldsymbol{w_s} := \frac{1}{\lambda n} \boldsymbol{\psi}_i(\boldsymbol{y}_i^*)$

Let $\gamma := \frac{2n}{k+2n}$, or find the optimal γ

Update $\boldsymbol{w}_i{}^{(k+1)} := (1-\gamma)\boldsymbol{w}_i{}^{(k)} + \gamma\, \boldsymbol{w_s}$

Update $\boldsymbol{w}^{(k+1)} := \boldsymbol{w}^{(k)} + \boldsymbol{w}_i{}^{(k+1)} - \boldsymbol{w}_i{}^{(k)}$

end for