Algorithm 1: Averaged Structured Perceptron

Input: Training sentences: $\{s_i\}_{i=1}^{N}$

1   $\theta \leftarrow 0$

2   **for** $t \leftarrow 1 \dots T$ **do**

3   **for** $i \leftarrow 1 \dots N$ **do**

4      $(\hat{g}_i, \hat{u}_i) = \arg\max_{g_i, u_i} \Phi(g_i, u_i, s_i, \mathcal{KB}) \cdot \theta$