Few-shot Out-of-Graph Link Prediction over Large Scale Multi-relational Social Networks

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Abstract. The abstract should briefly summarize the contents of the paper in 15–250 words.

Keywords: First keyword · Second keyword · Another keyword.

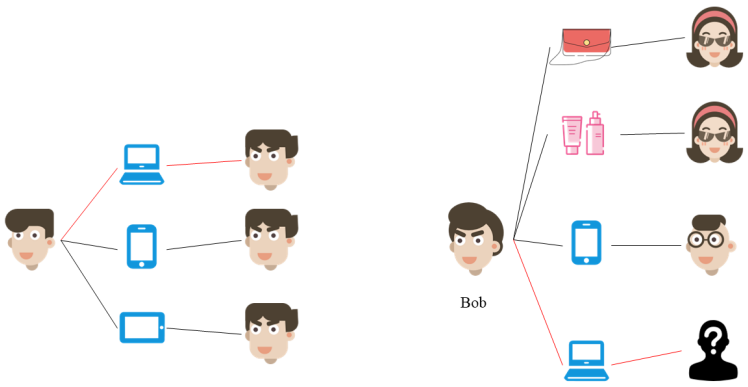

Fig. 1. Hyperparameters investigation for model ARNN+CDF.

References

Algorithm 1: Learning of MSRL

Input: Training tasks $\mathcal{T}_{train}$
Parameters: Meta relation embedding r_{meta}, relation learner ϕ.
while *not done* **do**
  sample a task $\mathcal{T}_r = (\mathcal{S}_r, \mathcal{Q}_r) \in \mathcal{T}_{train}$
  Relation embeddings $v = r_{meta} + \mathcal{N}(0, 1)$
  $loss_{\mathcal{S}} = 0$
  for (s_i, r_i, o_i) *in* $\mathcal{S}_r$ **do**
    $\hat{v}(r_i) = \phi(s_i, \text{Pooling}(v(r_j)|(s_i, r_j, o_i), r_j \neq r_i), o_i)$
    sample negative relation r_{in}
    $loss_{\mathcal{S}} += l_1(r_i, \hat{v}(r_i), r_{in})$
  end
  compute gradient and update $v' = v + \nabla_{\mathcal{S}} r_{meta}, \phi^{'} = \phi + \nabla_{\mathcal{S}}\phi$;
  for (s_i, r_i, o_i) *in* $\mathcal{S}_r$ **do**
    $\hat{v}^{'}(r_i) = \phi^{'}(s_i, \text{Pooling}(v'(r_j)|(s_i, r_j, o_i), r_j \neq r_i), o_i)$
  end
  $loss_{\mathcal{Q}} = 0$
  for (s_{ip}, r_{ip}, o_{ip}) *in* $\mathcal{Q}_r$ **do**
    $\hat{r}^{'}_{ip} = \phi^{'}(s_{ip}, \text{Pooling}(v'(r_j)|(s_{ip}, r_j, o_{ip}), r_j \neq r_i), o_{ip})$
    sample negative target node o_{in}
    $\hat{r}^{'}_{in} = \phi^{'}(s_{ip}, \text{Pooling}(v'(r_j)|(s_{ip}, r_j, o_{in}), r_j \neq r_i), o_{in})$
    $loss_{\mathcal{Q}} += l_2(\hat{v}^{'}, \hat{r}^{'}_{ip}, \hat{r}^{'}_{in})$
  end
  compute gradient and update $r_{meta} = r_{meta} + \nabla_{\mathcal{Q}} r_{meta}, \phi = \phi + \nabla_{\mathcal{Q}}\phi$;
end

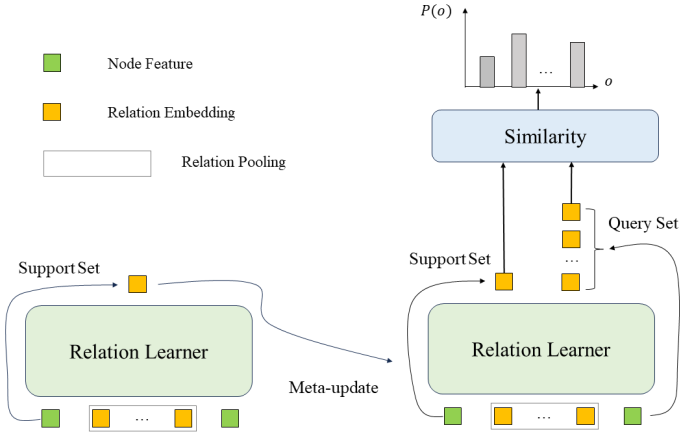

Fig. 2. Hyperparameters investigation for model ARNN+CDF.