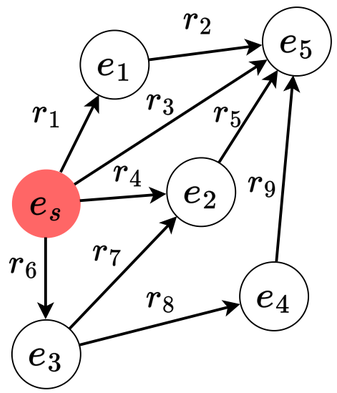
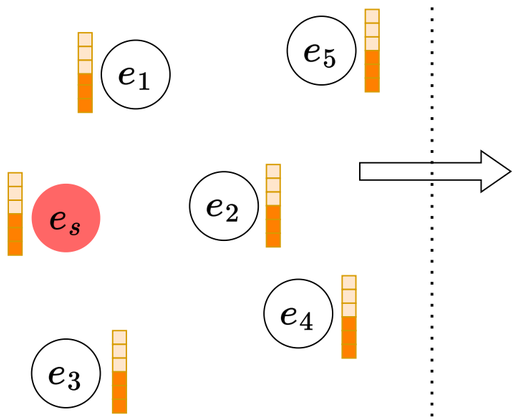


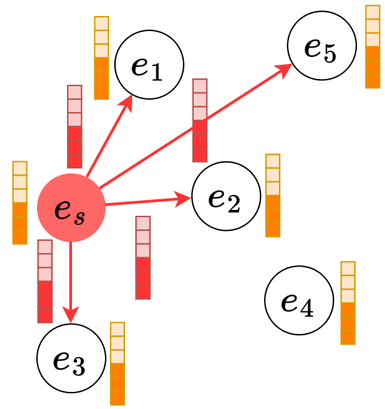
①输入知识图谱

③提供初始节点向量

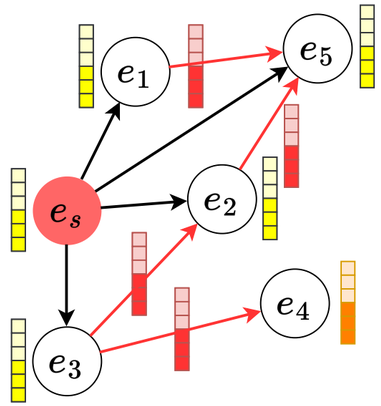
④图神经网络更新节点向量

初始节点向量　消息向量　更新后的节点向量

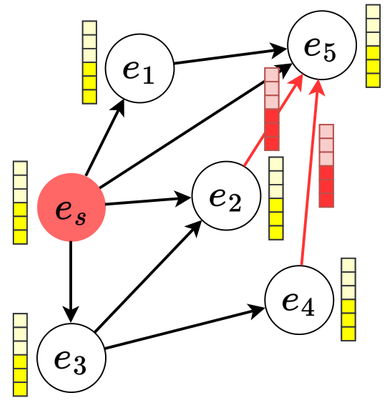




Step1

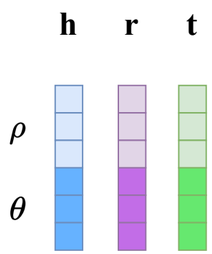


Step2



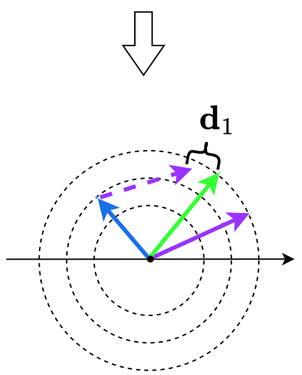
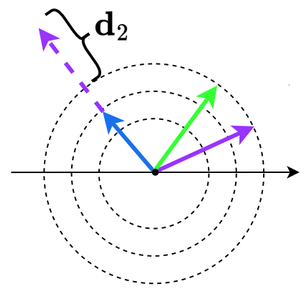
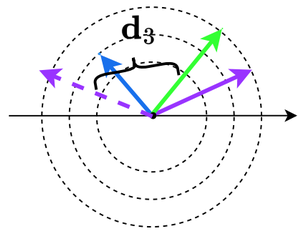
Step3

②层次信息提取



$$f_r(h,t) = -\lambda_1 \mathbf{d}_1 - \lambda_2 \mathbf{d}_2 - \lambda_3 \mathbf{d}_3$$

$$\mathbf{d}_1 = |\mathbf{h} + \mathbf{r} - \mathbf{t}|$$

$$\mathbf{d}_2 = |\rho_h \circ \rho_r - \rho_t|$$

$$\mathbf{d}_3 = |(\theta_h + \theta_r) mod 2\pi - \theta_t|$$