$$\begin{split} Q(s,\,g) &= Q(s,\,g) + \alpha \left(\tilde{r} + \tilde{\gamma} \cdot \max \hat{Q}_{\theta} \cdot \left(\tilde{S}',\, \operatorname*{argmax}_{g} Q_{\theta}(\tilde{S}',\,g) \right) - Q(s,\,g) \right) \end{split}$$
 where $\tilde{r} = \sum_{k=0}^{n} \gamma^{k} \cdot r, \; \tilde{\gamma} = \gamma^{n+1}$