
The paper has mistakes in equations and notation due to typo. The agent state is defined as \( V_{agent}(s) = Q(s, a_{max}) \). Therefore, the agent state value is calculated using info of one step less than that of SOC state value \( V(s) \). Therefore, "M" in the last term of equation (5) and (6) should be "M-1". Also \( \gamma_g \) should be \( \gamma_c \).

You may find the corrected part of the paper below:

If the state transitions are optimal or they follow the optimal path from the current state to the goal state, then the virtual reward (the difference of the values between two consecutive SOCs) is:

\[
\Delta V = V(s_{t+1}^c) - V(s_t^c) = (\gamma_c^{M-1} - \gamma_c^M)r_c. \quad (4)
\]

If this virtual reward \( r_c \) is used for each agent along with reward \( r \) for the task achievement, then the value of the state perceived by the agent can be calculated as:

\[
V_{agent} = \beta[(\gamma_c^{M-1} - \gamma_c^M)r + \gamma(\gamma_c^{M-2} - \gamma_c^{M-1})r + ... + \gamma^{M-1}(1 - \gamma_c)] + \gamma^{M-1}r_c,
\]

\[
= \beta(1 - \gamma_c)(\gamma_c^{M-1} + \gamma\gamma_c^{M-2} + ... + \gamma^{M-1})r + \gamma^{M-1}r_c, \quad (5)
\]

where \( \gamma \) is the individual discount factor. If \( \gamma \) is chosen to be \( \kappa \gamma_c \), then the local value given above will be (regarded as a function of \( M \)):

\[
V_{agent}(M) = \beta(1 - \gamma_c)\gamma_c^{M-1}(1 + \kappa + ... + \kappa^{M-1})r + \gamma_c^M\kappa^{M-1}r_c,
\]

\[
= \beta(1 - \gamma_c)\gamma_c^{M-1}\frac{(1 - \kappa^M)}{1 - \kappa}r + \gamma_c^M\kappa^{M-1}r_c. \quad (6)
\]


In the above paper a reference has been missing by mistakes: The sentence in the line 29-31 in Column 2 of the first page should have referred to: T. Kim, C. Manzie, and H. Watson, Fuel economy benefits of look-ahead capability in a mild hybrid configuration, “in IFAC World Congress 08, July 2008.”