

Corrigendum for: R. V. Self *et al.*, “Online observer-based inverse reinforcement learning,” *IEEE Control Syst. Lett.*, vol. 5, no. 6, pp. 1922–1927, 2021. DOI: 10.1109/LCSYS.2020.3046527

Rushikesh Kamalapurkar

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1. Page 1923: the definitions of the ideal weights have unnecessary factors of 2, they should be:

$$\begin{aligned} W_V^* &= \left[ S_{11}, S_1^{(-1)}, S_{22}, S_2^{(-2)}, \dots, S_{n-1}^{-(n-1)}, S_{nn} \right]^T, \\ W_Q^* &= \left[ Q_{11}, Q_1^{(-1)}, Q_{22}, Q_2^{(-2)}, \dots, Q_{n-1}^{-(n-1)}, Q_{nn} \right]^T, \\ W_R^* &= \left[ R_{11}, R_1^{(-1)}, R_{22}, R_2^{(-2)}, \dots, R_{m-1}^{-(m-1)}, R_{mm} \right]^T. \end{aligned}$$

2. Page 1923: After Equation 3, the size of the zero matrix in the expression for  $\sigma_{\Delta_u}$  should be  $m \times P$ , not  $m \times n$ .
3. Page 1923: The expression for  $\sigma_{R2}(u)$  is incorrect, it should be:

$$\sigma_{R2}(u) = \begin{bmatrix} u^T & 0_{1 \times m-1} & 0_{1 \times m-2} & \dots & 0 \\ u_{(1)}e_{2,m} & (u^{(-1)})^T & 0_{1 \times m-2} & \dots & 0 \\ u_{(1)}e_{3,m} & u_{(2)}e_{2,m-1} & (u^{(-2)})^T & \dots & 0 \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ u_{(1)}e_{m,m} & u_{(2)}e_{m-1,m-1} & u_{(3)}e_{m-2,m-2} & \dots & (u^{-(m-1)})^T \end{bmatrix},$$

where  $e_{i,j}$  denotes a row vector of size  $j$ , with a one in the  $i$ -th position and zeros everywhere else, and  $u_{(i)}$  denotes the  $i$ -th element of  $u$ .

4. Page 1924: After Equation 4, the size of the zero matrix in the expression for  $\sigma_{\Delta_u}$  should be  $m \times P$ , not  $m \times n$ .