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**Algorithm 1** WIS-LSTD( $\lambda$ )

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**Initialization:**

Set  $\mathbf{A}_0 = \epsilon \mathbf{I}$ ,  $\mathbf{b}_0 = \mathbf{0}$ ,  $\mathbf{e}_{-1} = \mathbf{0}$ ,  $\mathbf{V}_0 = \mathbf{0}$  and  $\mathbf{u}_0 = \mathbf{0}$

**for**  $t = 0, 1, \dots$  **do**

    receive  $\phi_t, \rho_t, \gamma_t, \lambda_t, R_{t+1}, \phi_{t+1}, \gamma_{t+1}, \lambda_{t+1}$

$$\mathbf{e}_t = \rho_t(\phi_t + \gamma_t \lambda_t \mathbf{e}_{t-1})$$

$$\mathbf{A}_{t+1} = \mathbf{A}_t + \mathbf{e}_t(\phi_t - \gamma_{t+1} \phi_{t+1})^\top + (\rho_t - 1) \mathbf{V}_t$$

$$\mathbf{b}_{t+1} = \mathbf{b}_t + R_{t+1} \mathbf{e}_t + (\rho_t - 1) \mathbf{u}_t$$

$$\boldsymbol{\theta}_{t+1} = (\mathbf{A}_{t+1})^{-1} \mathbf{b}_{t+1}$$

$$\mathbf{u}_{t+1} = \gamma_{t+1} \lambda_{t+1} (\rho_t \mathbf{u}_t + R_{t+1} \mathbf{e}_t)$$

$$\mathbf{V}_{t+1} = \gamma_{t+1} \lambda_{t+1} (\rho_t \mathbf{V}_t + \mathbf{e}_t(\phi_t - \phi_{t+1})^\top)$$

**end for**

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