$$\xi^{(i)v} = \mu^{(i-1)v} - g(\mu^{(i)}) - \Lambda(\mu^{\lambda(i)z})\xi^{(i)v}$$
$$\xi^{(i)x} = D\mu^{(i)x} - f(\mu^{(i)}) - \Lambda(\mu^{\lambda(i)w})\xi^{(i)x}$$

Forward prediction error

Backward predictions

$$\dot{\mu}^{(i)v} = D\mu^{(i)v} - \varepsilon_v^{(i)T}\xi^{(i)} - \xi^{(i+1)v}$$
$$\dot{\mu}^{(i)x} = D\mu^{(i)x} - \varepsilon_x^{(i)T}\xi^{(i)}$$

Associative plasticity

$$\dot{\mu}_{ij}^{\theta} = A_{ij}^{\theta}$$
$$\dot{A}_{ij}^{\theta} = -\xi^T \varepsilon_{\theta_{ij}}$$

Neuromodulation

$$\dot{\mu}_i^{\lambda} = A_i^{\lambda}$$
$$\dot{A}_i^{\lambda} = \tfrac{1}{2} tr(R_i(\xi\xi^T - \Pi(\mu^{\lambda})))$$