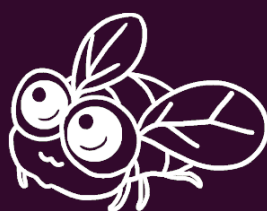
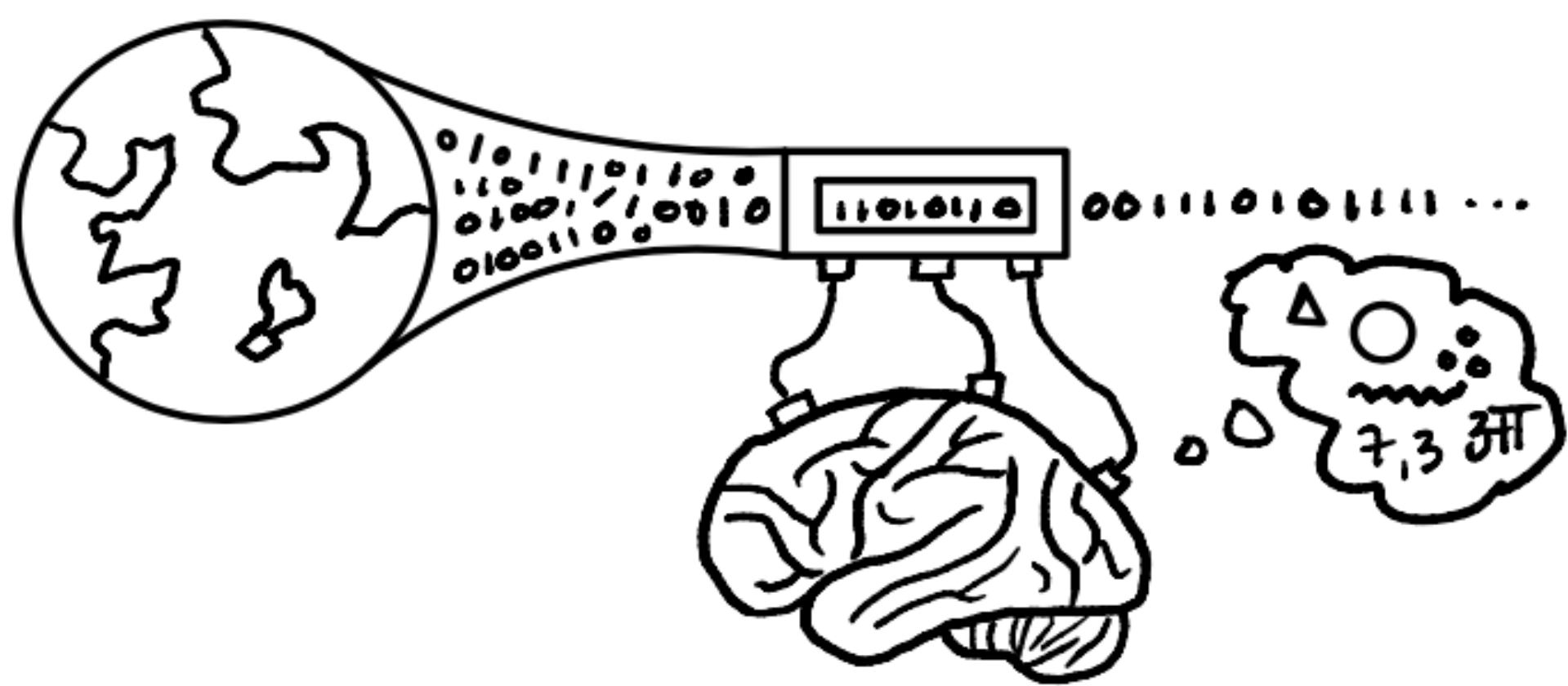


We can use auxiliary objectives to adapt Neural Network connectivity and **find structure in data on the fly.**



Problem Setting

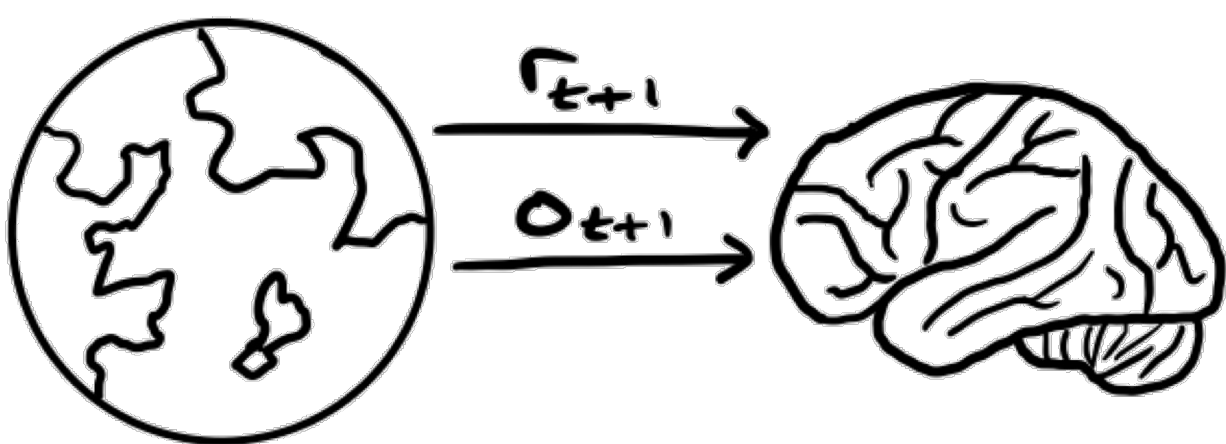
- Learning from Uninterpreted Sensory Experience**



John D. Martin

- Reinforcement Learning Prediction**

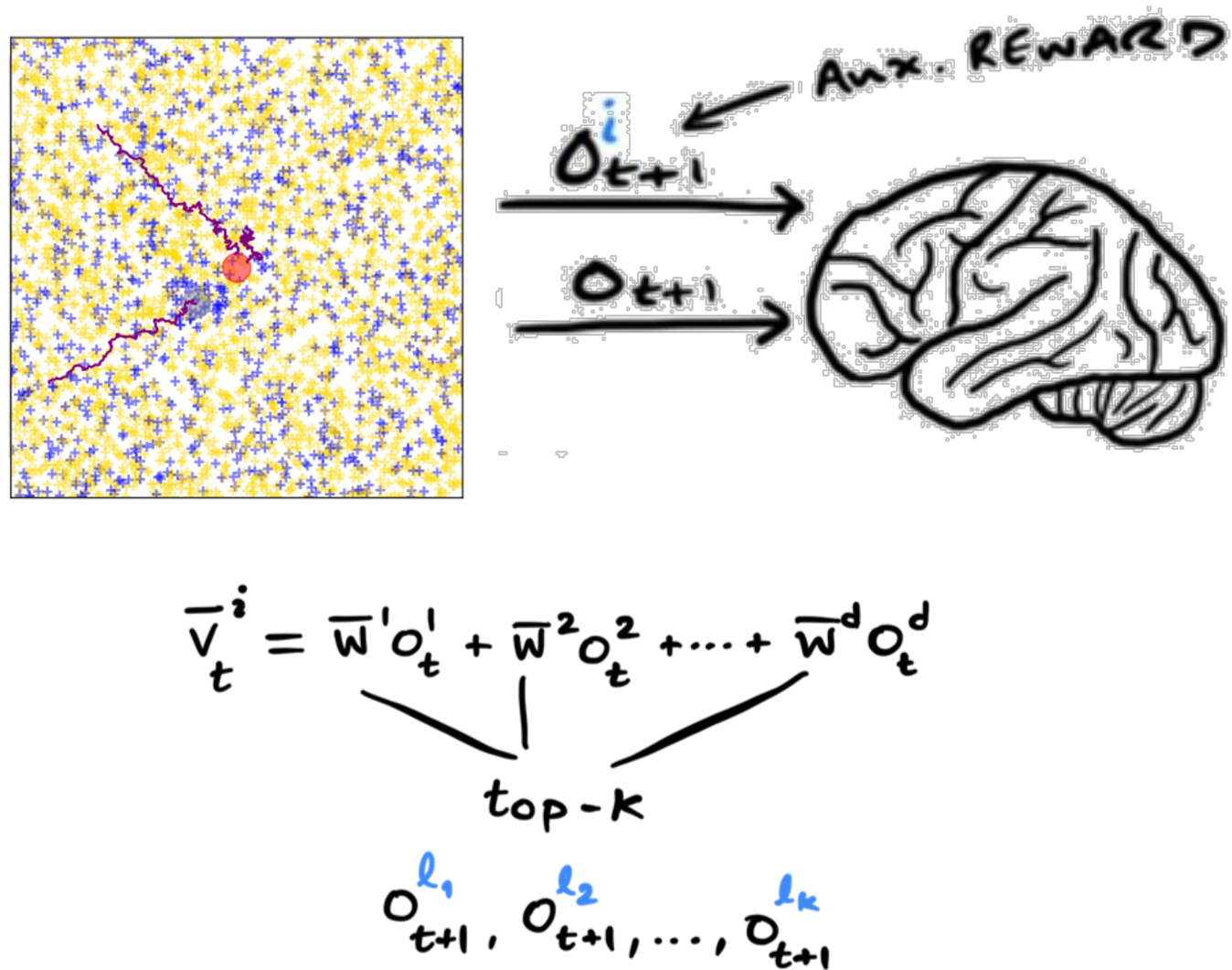
$$\hat{v}_w(o) \approx \mathbb{E}_\pi[R_{t+1} + \gamma R_{t+2} + \dots | O_t = o]$$



- How can the agent **relate inputs** to improve the **accuracy** of its **predictions**?

Prediction Adapted Networks

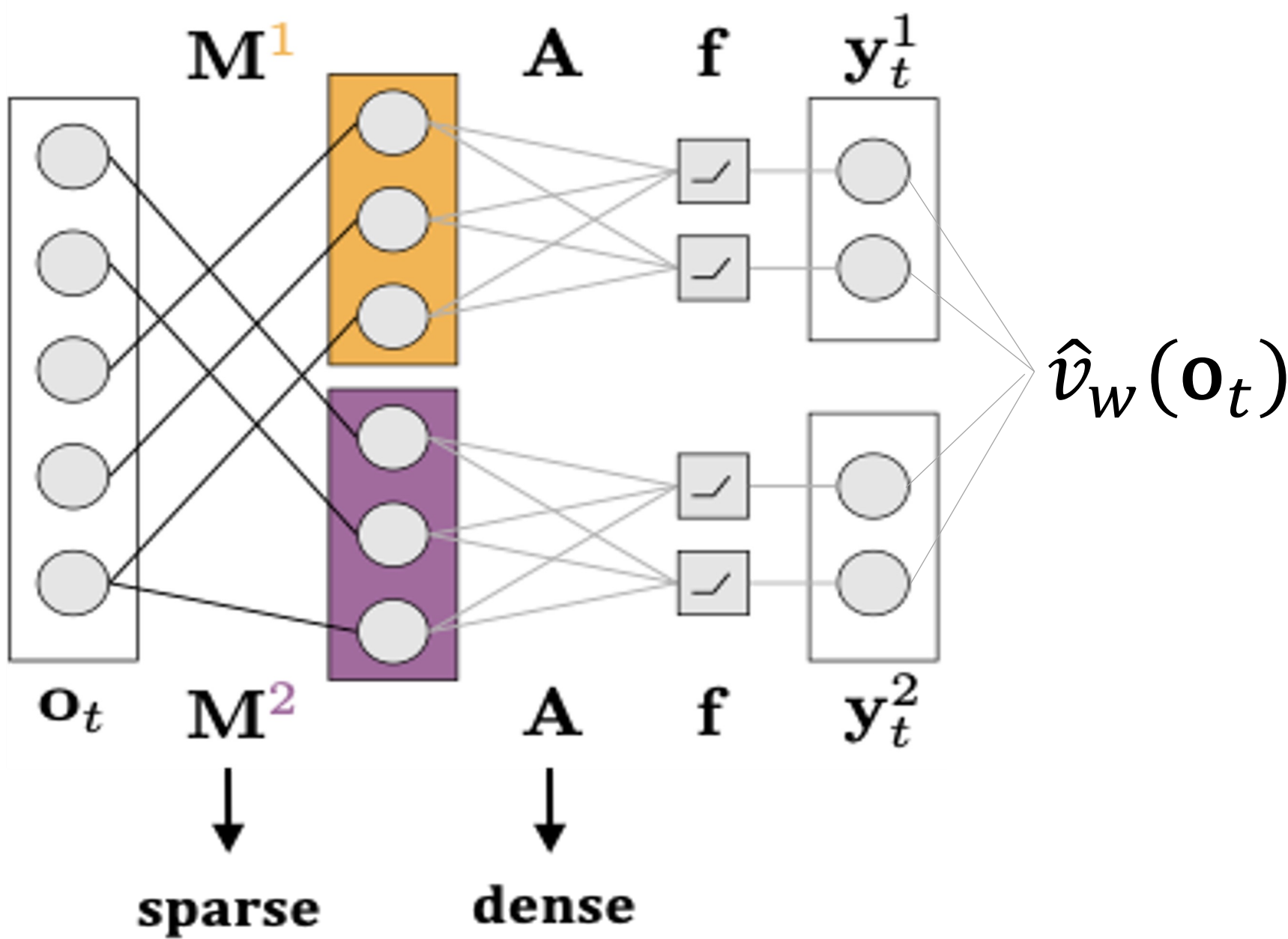
- Auxiliary objectives:** predict if the i^{th} sensor will turn on next time



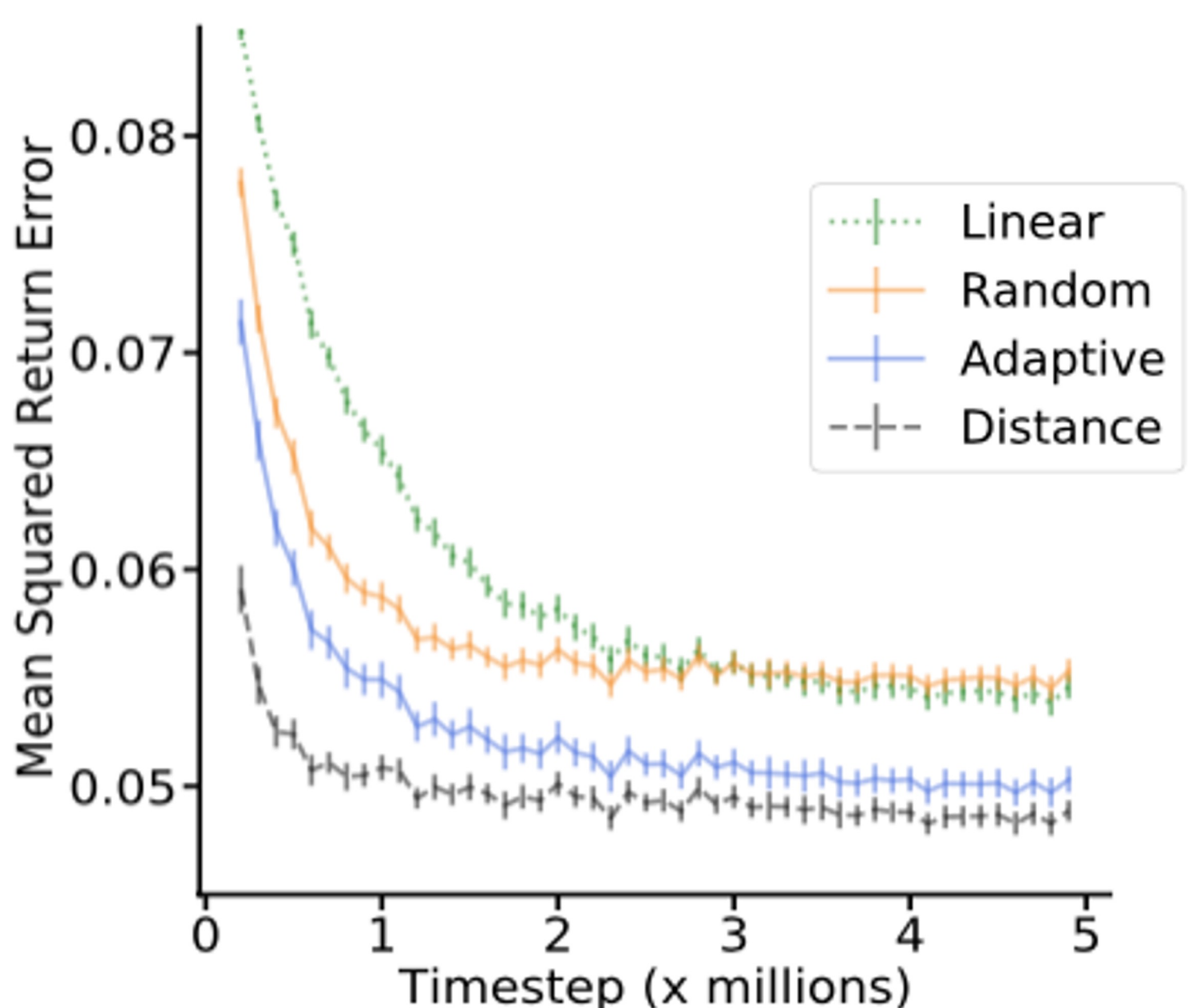
$$\bar{V}_t^i = \bar{w}^1 o_t^1 + \bar{w}^2 o_t^2 + \dots + \bar{w}^d o_t^d$$

top-k

$$o_{t+1}^{l_1}, o_{t+1}^{l_2}, \dots, o_{t+1}^{l_k}$$



Performance Results



Additional Results

