$$egin{aligned} \epsilon_1 &= |x-z| \ au_1 rac{du}{dt} &= -u + \Pi_1 \epsilon_1 + w_u \ \epsilon_2 &= u(t- au_2) \ au_3 rac{dv}{dt} &= -v + \Pi_2 \epsilon_2 + \Pi_3 z + w_v \ au_4 rac{dz}{dt} &= -z + x(t- au_5) + w_z \ \int z dt &= Z_{threshold}, ext{then reset z to 0} \ w \sim N(0, 0.001) \end{aligned}$$

u: proxy of Predicting Error: driven by (sensory_input - pain_percept) v: proxy of Prediction: driven by u, z