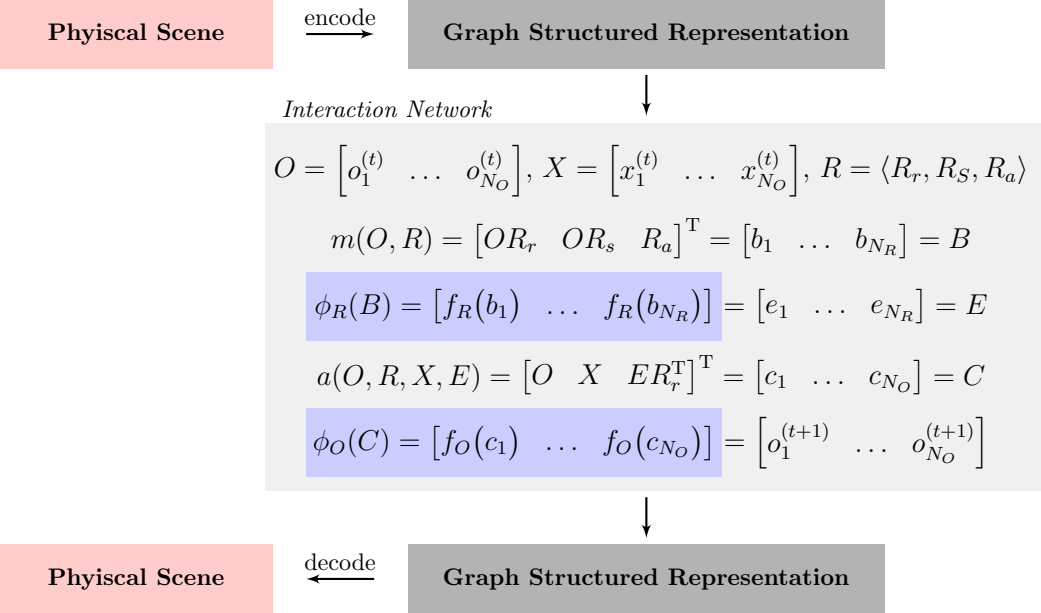
Phyiscal Scene
encode
Graph Structured Representation
Interaction Network
$O = \begin{bmatrix} o_1^{(t)} & \dots & o_{N_O}^{(t)} \end{bmatrix}, X = \begin{bmatrix} x_1^{(t)} & \dots & x_{N_O}^{(t)} \end{bmatrix}, R = \langle R_r, R_S, R_a \rangle$
$m(O, R) = \begin{bmatrix} OR_r & OR_s & R_a \end{bmatrix}^{\mathrm{T}} = \begin{bmatrix} b_1 & \dots & b_{N_R} \end{bmatrix} = B$
$\phi_R(B) = \begin{bmatrix} f_R(b_1) & \dots & f_R(b_{N_R}) \end{bmatrix} = \begin{bmatrix} e_1 & \dots & e_{N_R} \end{bmatrix} = E$
$a(O, R, X, E) = \begin{bmatrix} O & X & ER_r^{\mathrm{T}} \end{bmatrix}^{\mathrm{T}} = \begin{bmatrix} c_1 & \dots & c_{N_O} \end{bmatrix} = C$
$\phi_O(C) = \begin{bmatrix} f_O(c_1) & \dots & f_O(c_{N_O}) \end{bmatrix} = \begin{bmatrix} o_1^{(t+1)} & \dots & o_{N_O}^{(t+1)} \end{bmatrix}$
Phyiscal Scene
decode
Graph Structured Representation