

$$\mathcal{G} = (\mathcal{V}_G, \mathcal{V}_1, \dots, \mathcal{V}_J)$$

$$\mathcal{E} = \{(r, s) | (r, s) \in \mathcal{E}_G \\ \text{or } s \in \mathcal{V}_G, r \in \mathcal{V}_j \\ \text{or } (r, s) \in \mathcal{V}_j\}$$

$$U(X) = \sum_{(s,r) \in \mathcal{V}_G} \beta \psi(x_s, x_r) \\ + \sum_{j=1}^J \left(\sum_{(s, \tilde{s})} \alpha \psi(x_s, x_{\tilde{s}}) \right. \\ \left. + \sum_{(s,r) \in \mathcal{V}_j} \beta \psi(x_s, x_r) \right).$$

