

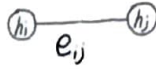
Graph Convolution Network

그래프 내부의 연결 관계를 정의 → social Graph, 3D Mesh, Molecular Graph

→ Graph

$$G = (\underbrace{V}_{\text{Vertex}}, \underbrace{E}_{\text{Edge}}, \underbrace{A}_{\text{Adjacency matrix}})$$

Vertex Node Edge Adjacency matrix



→ Graph Convolution Network

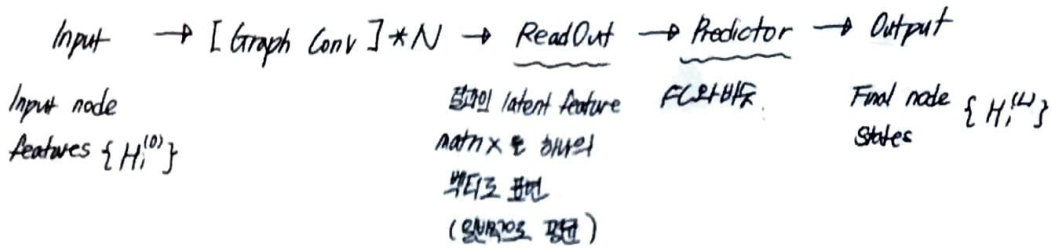
make each layer of network update values of each node feature

$$\underbrace{H^{(l+1)}}_{\text{output feature}} = \delta \left(\underbrace{A}_{\text{adjacency matrix}} \underbrace{H^{(l)}}_{\text{input feature}} \underbrace{W^{(l)}}_{\text{weights (shared)}} + \underbrace{b^{(l)}}_{\text{bias}} \right) \leftarrow \underbrace{h_i^{(l+1)}}_{\text{output feature}} = \underbrace{W^l}_{\text{kernel}} * \underbrace{h_i^{(l)}}_{\text{input feature}} \quad \text{layer}$$

$$\rightarrow H = \psi(A, X) = \delta(A \times W)$$

인접행렬 곱하기

• overall structure of GCN



• 적용 예시: Inception, Skip Connection (Residual Block), Attention $\leftarrow H^{(l+1)} = \delta(\sum \alpha H W)$