# Graph Neural Networks (GNN) for Multimodal Fusion

**Improving fusion quality by modeling inter-modal relationships with medical knowledge graphs and GNN**

## Medical Knowledge Graph

Structured medical knowledge representation

- Nodes: Diseases, symptoms, tests, treatments
- Edges: Relationships (causes, diagnosis, treatment)
- Attributes: Probability, frequency, severity
- Ontology integration (SNOMED, ICD)

## GNN Architecture

Graph-based learning

- Graph Convolution (GCN)
- Graph Attention (GAT)
- Message Passing
- Graph Pooling

## Multimodal Graph Construction

Integrating heterogeneous data into graphs

- Each modality = Node type
- Inter-modal relationships = Edges
- Patient-specific subgraphs
- Dynamic graph updates

## Medical Applications

GNN-based fusion cases

- Disease prediction: Symptom graphs
- Drug interaction modeling
- Patient similarity graphs
- Knowledge-based reasoning

**Multiple Disease Comorbidity Prediction**

**Personalized Treatment Recommendation**

**Clinical Pathway Optimization**