

## Attention-Based Fusion

Fusion by dynamically adjusting inter-modal importance using Cross-attention and Self-attention

### Self-Attention

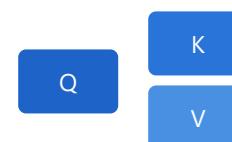
Input Sequence



Attention Matrix

### Cross-Attention

Modality A   Modality B



Cross Attention

A attends to B

### Self-Attention

Internal relationships within a single modality

- Query, Key, Value transformation
- Calculate similarity between all positions
- Update representation with weighted sum

### Cross-Attention

Inter-modal interaction

- Query from one modality
- Key, Value from another modality
- Information exchange between modalities

- Capture long-range dependencies

- Selective information extraction

## Multi-Head Attention

Fusion from multiple perspectives

- Multiple attention heads in parallel
- Each head focuses on different features
- Concatenate results
- Enhanced representation power

## Medical Applications

Attention-based medical fusion

- Image-to-text attention
- Multi-timepoint image fusion
- Time-series + static data
- Interpretable weights

Image-Report  
Alignment

Multi-Sequence  
MRI Fusion

Clinical Data  
Integration