

Image Registration

Rigid vs non-rigid

Translation/rotation vs deformation

Similarity metrics

Mutual information, correlation

Optimization methods

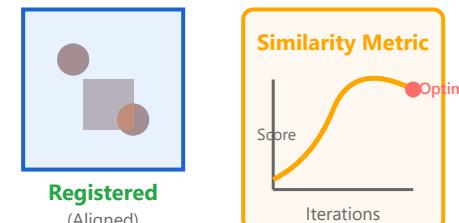
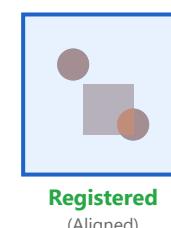
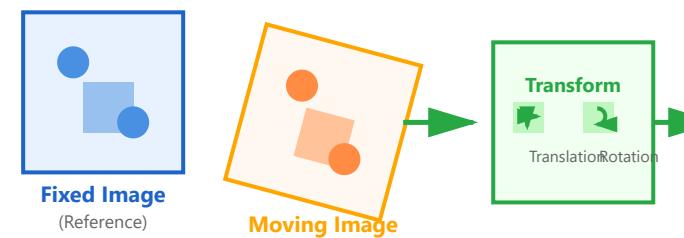
Gradient descent, genetic algorithms

Multi-modal registration

Aligning different imaging modalities

Validation approaches

Fiducial markers, Dice coefficient



Clinical Applications

- Multi-modal fusion (MRI + PET)
- Longitudinal analysis (tumor growth)
- Atlas-based segmentation
- Image-guided surgery planning