Class Activation Maps (CAM)

CAM Principles

Visualize important regions for classification. Linear combination of feature maps weighted by class weights

Grad-CAM

Gradient-based localization. Works with any CNN architecture without modification

Grad-CAM++

Improved weighted combination. Better localization for multiple objects and weak activations

Score-CAM

Gradient-free approach using forward passes. More stable and cleaner visualizations

Clinical Interpretation

Essential for model validation and trust building. Helps radiologists understand AI decisions