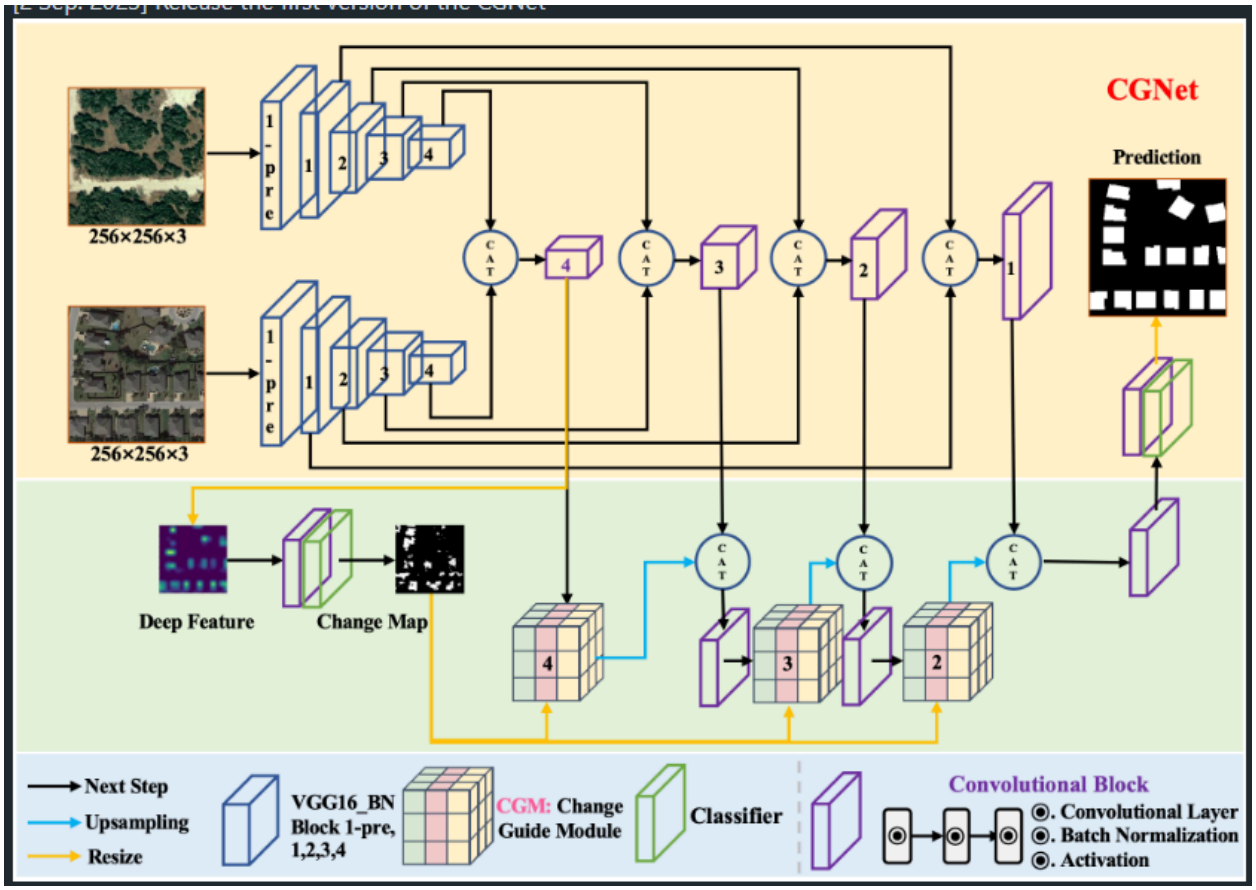
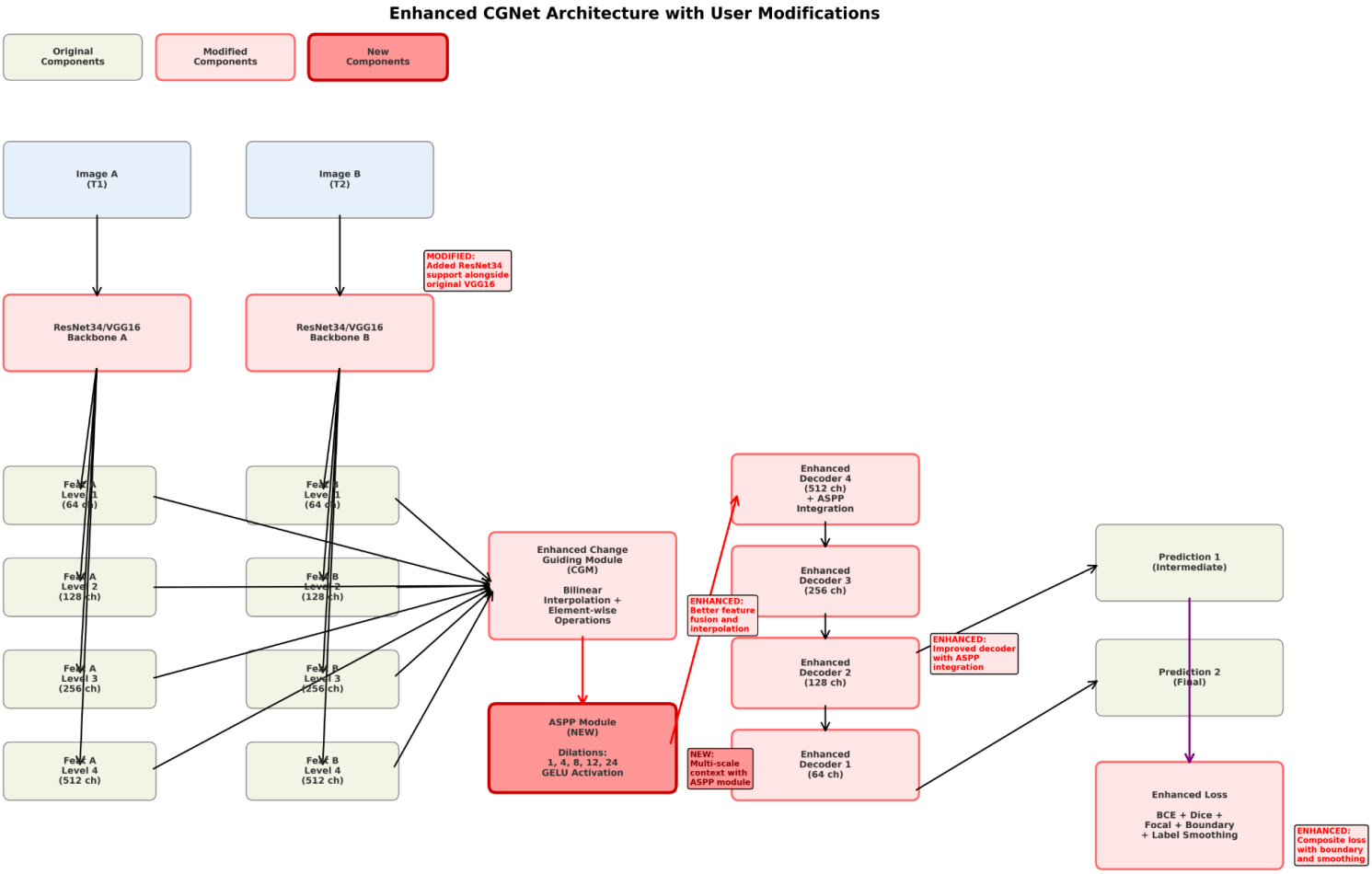
Change Guiding Network: Incorporating Change Prior to Guide Change Detection in Remote Sensing Imagery





ASPP module

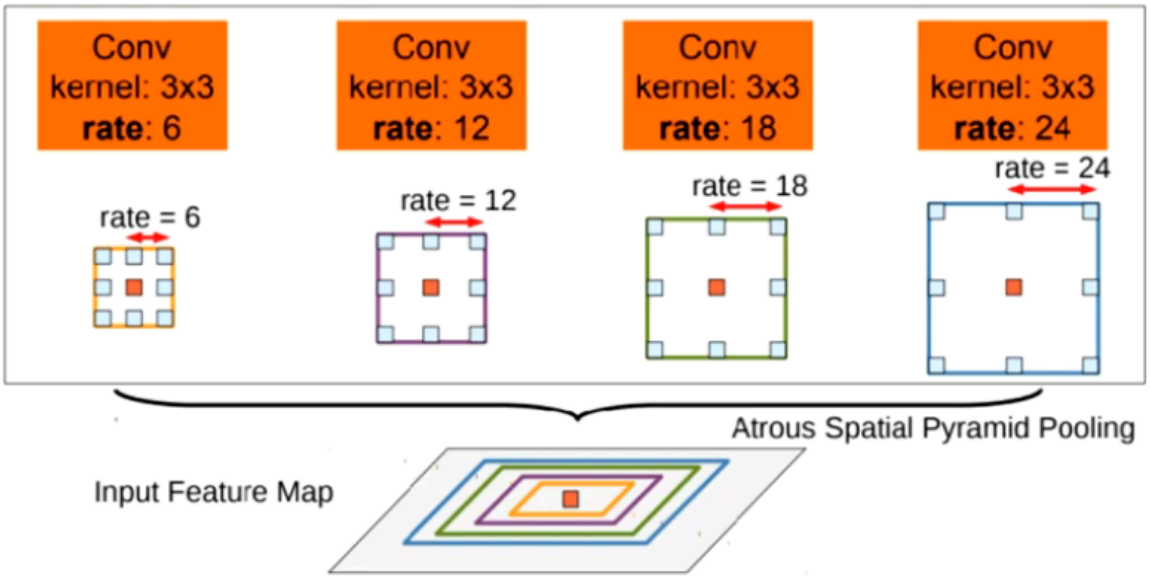
Key Features of Your ASPP
Multi-Scale Dilation Rates:
Dilation rates: (1, 4, 8, 12, 24)
Purpose: Capture features at different scales
dilation=1: Standard convolution (fine details)
dilation=4: 4× wider receptive field
dilation=8: 8× wider receptive field
dilation=12: 12× wider receptive field
dilation=24: 24× wider receptive field (very large context)

Enhanced Activations:
GELU activation instead of ReLU for smoother gradients

Batch Normalization for training stability
Dropout (0.3) for regularization

Global Context:
AdaptiveAvgPool2d(1): Captures global image context
Interpolation: Resizes global features back to original size

ASPP (Atrous Spatial Pyramid Pooling) is integrated as an optional enhancement in your CGNet architecture, using multiple dilated convolutions with rates (1,4,8,12,24) plus global average pooling to capture multi-scale contextual information. It's implemented in CGNet.py (lines 209-244) as a separate class with GELU activation and can be optionally enabled during training through the interactive configuration in train_CGNet.py. The module processes feature maps from the backbone encoder to extract both local details and global context simultaneously, improving change detection accuracy by understanding spatial relationships at different scales. When enabled, ASPP enhances the network's ability to detect changes of varying sizes and shapes in remote sensing imagery, contributing to better segmentation boundaries and reduced false positives.



Results

Dataset	Precision	Recall	Overall Accuracy (OA)	Kappa	IoU
LEVIR-CD	0.9012	0.8425	0.9543	0.8610	**86.0%**
SYSU-CD	0.8529	0.7563	0.9118	0.7452	**66.9%**