CT-UNet: An Improved Neural Network Based on U-Net for Building Segmentation in Remote Sensing Images

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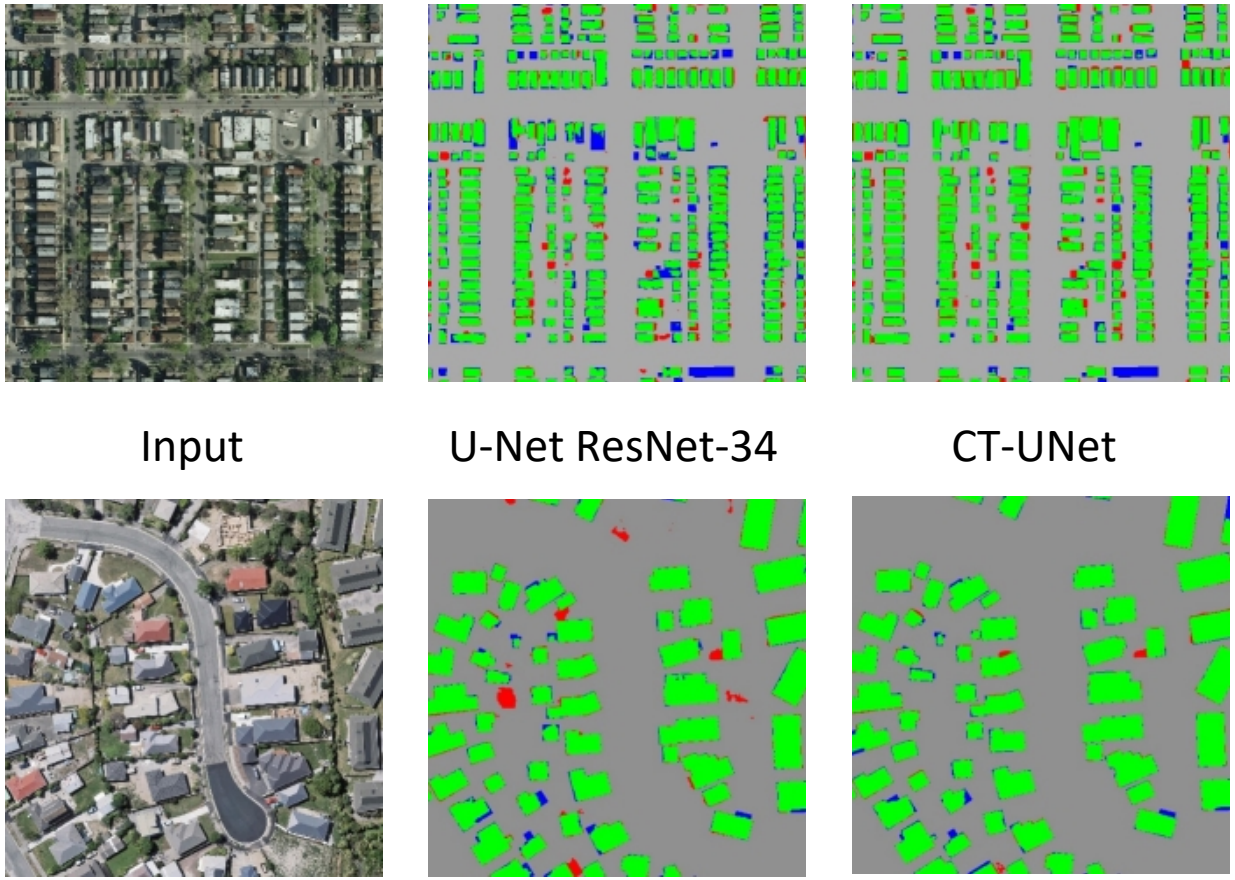


Figure1. Examples of problem in instance segmentation. In the first line, a large number of buildings are identified as backgrounds, which is the intra-class inconsistency problem. In the second line, there are false positive pixels (red) and false negative pixels (blue) at the edge of the building, which is the fuzzy boundary problem.
Green: true positive (tp) pixels. Gray: true negative (tn) pixels. Red: false positive (fp) pixels. Blue: false negative (fn) pixels.

1、a so-called Context Transfer U-Net (CT-UNet) for Buiding segmentation in remote sensing images.

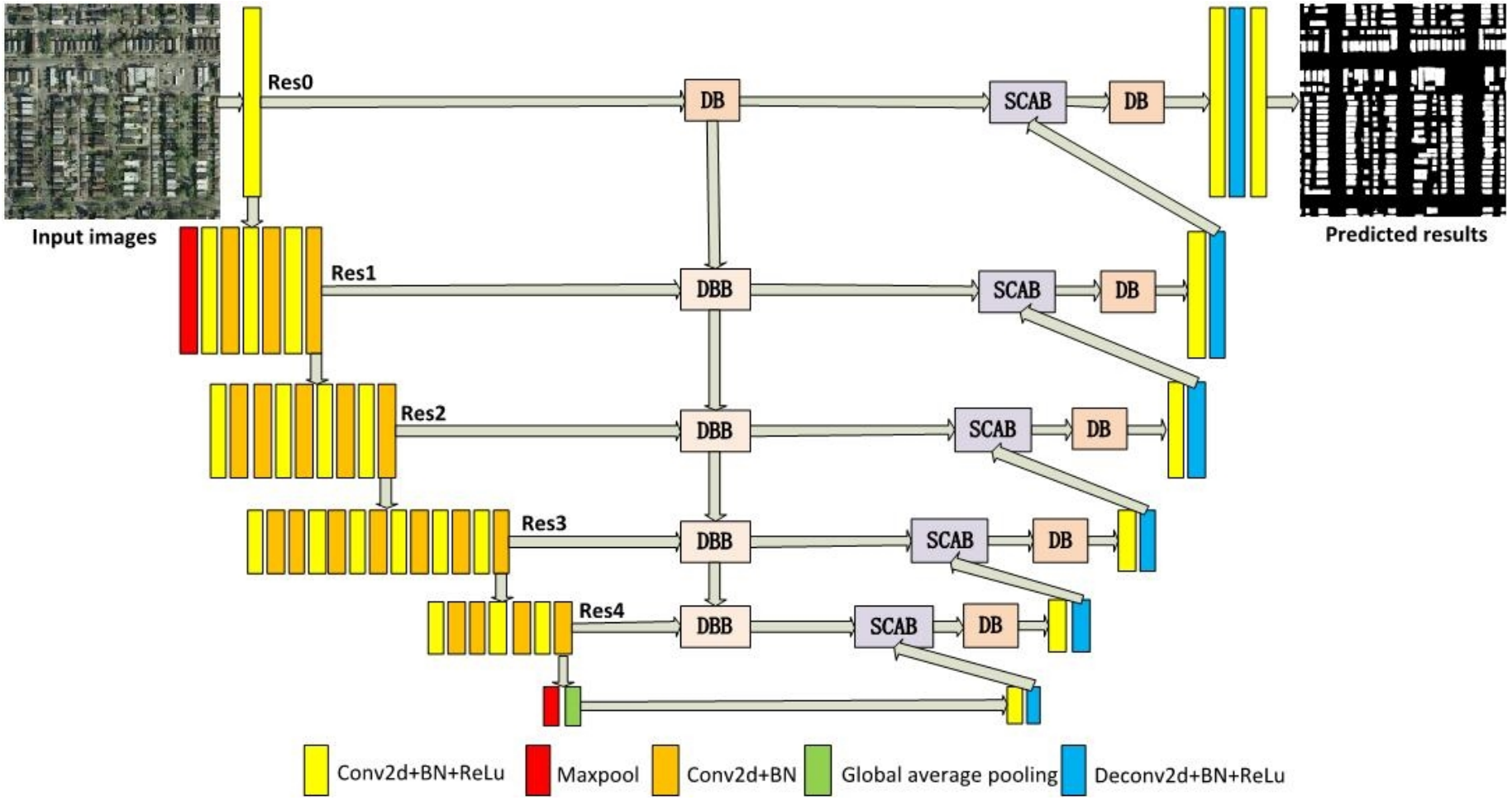


Figure2. Architecture of CT-UNet. DBB: Dense Boundary Block. DB: Dense Block. SCAB: Spatial Channel Attention Block.

2、We present Dense Boundary Block running through the entire network to solve fuzzy boundary problem.

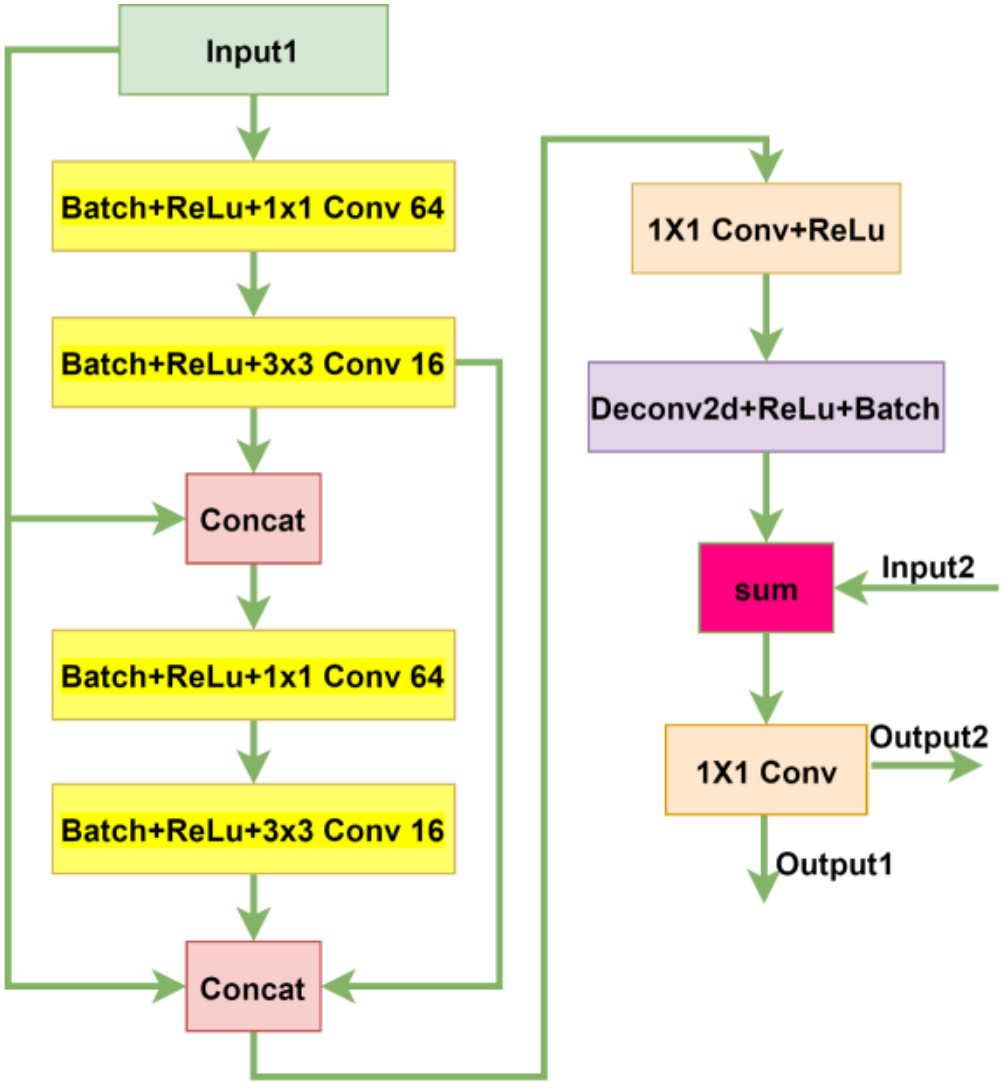


Figure3. Components of the Dense Boundary Block (DBB). The left half of the graph is Dense Block(DB), and the right half of the graph is Boundary Block(BB). Input1 represents the features of the current stage, and Input2 represents the features of the lower stage. Output1 represents the features output to the next DBB, and Output2 represents the features output to the decoder.

3、We construct Spatial Channel Attention Block to handle the problem of intra-class inconsistency.

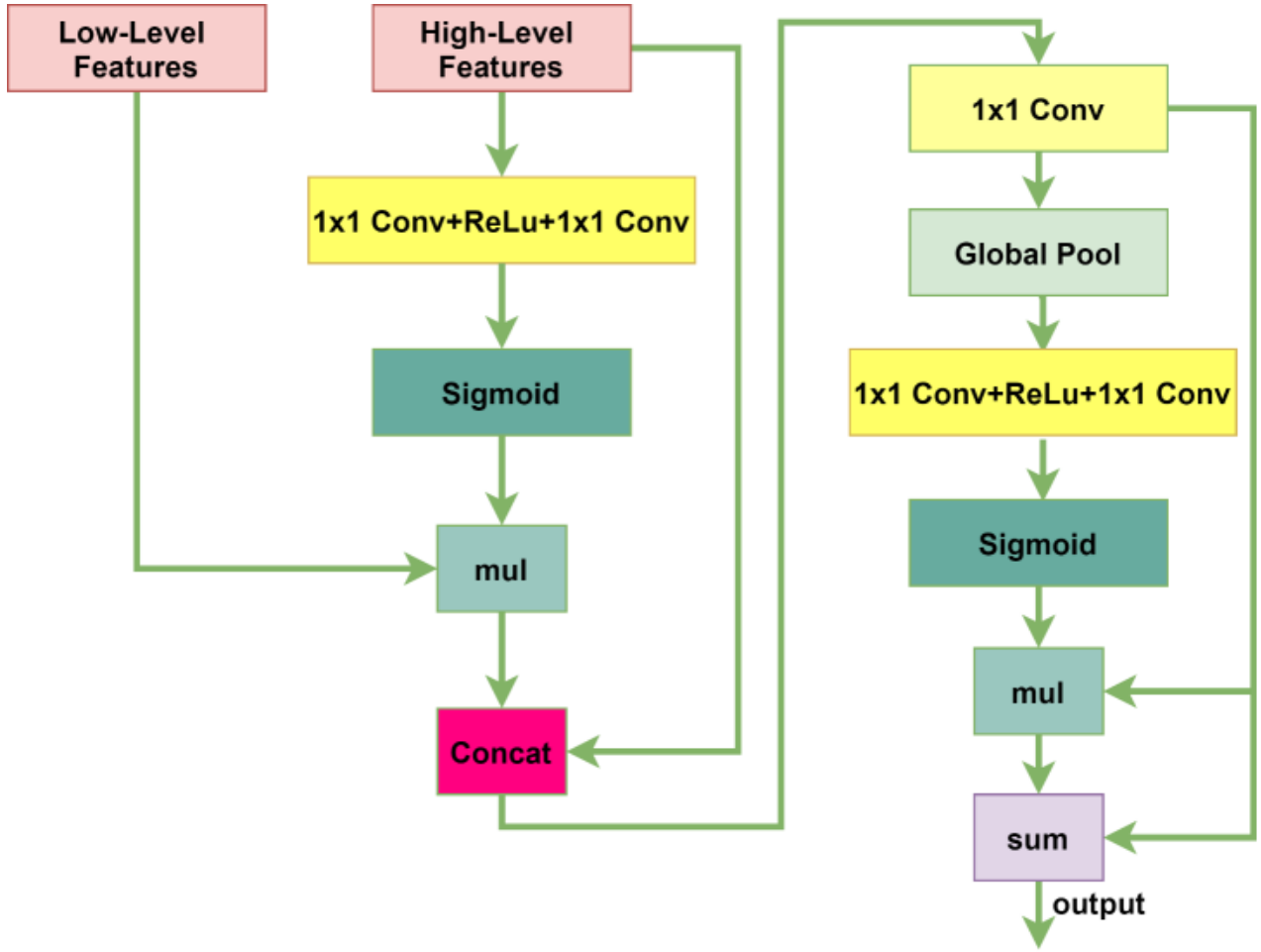
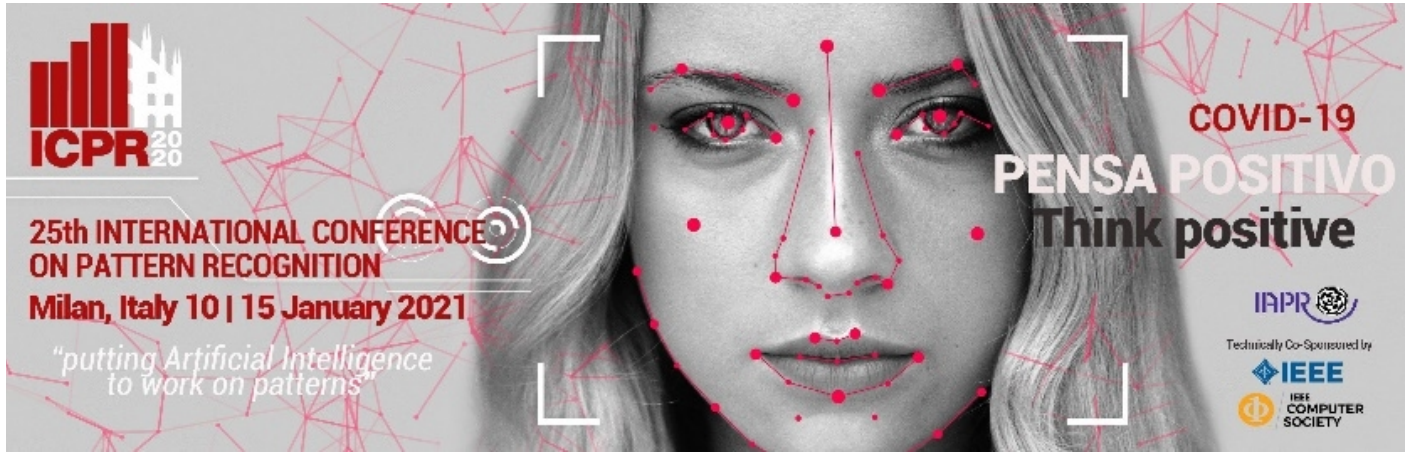


Figure4. Components of the Spatial Channel Attention Block (SCAB). The left half of the graph is spatial attention mechanism, and the right half of the graph is channel attention mechanism.



Thank you for listening