# Evaluation of Wavelet Fusion Method
# On Land Cover Classification
# In Bodetabek Area, Indonesia

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*Abstract*— This paper aims to present an evaluation of wavelet fusion method on land cover classification task. Wavelet fusion is one of the pan-sharpening methods which combines the higher spatial resolution panchromatic image with the lower resolution multispectral image to create high resolution fused image. Data fusion using multispectral and high spatial resolution panchromatic images are useful for improving classification accuracy. The study area of our research is Bodetabek (Bogor, Depok, Tangerang, and Bekasi) area, Indonesia. Different wavelet bases (Haar, Db2 to Db6, Coif1 to Coif5, and Sym1 to Sym5) were examined to determine the best basis for the data fusion process. This study also examined the effect of wavelet decomposition level to the spatial and spectral quality of the fused image. The experimental results on LANDSAT data show that the best basis for wavelet fusion is Coif5. The classification accuracy assessment on different wavelet decomposition level fused image also demonstrates that the higher wavelet decomposition, the higher spatial quality of the fused image. Although the spectral quality was degraded as the wavelet decomposition level increased, the classification accuracy assessment results show that higher wavelet decomposition level yields better overall classification accuracy (96.28% for eight decomposition level vs 82.77% for two decomposition level).

*Keyword*— LANDSAT, Pan-sharpening, Wavelet Fusion, Land cover Classification.
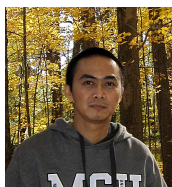
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