IMAGE FUSION USING WAVELET TRANSFORM WITH QUADTREE SEGMENTATION

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ABSTRACT

THE PURPOSE OF IMAGE FUSION IS TO INTEGRATE COMPLEMENTARY INFORMATION FROM MULTISENSOR DATA SO THE NEW IMAGES ARE MORE SUITABLE FOR HUMAN VISUAL PERCEPTION OR COMPUTER PROCESSING TASKS SUCH AS SEGMENTATION, FEATURE EXTRACTION, AND OBJECT RECOGNITION. THIS THESIS IS FOCUSED ON THE IMPROVEMENT OF IMAGE FUSION SCHEME WHICH IS BASED ON QUADTREE SEGMENTATION WITH WAVELET TRANSFORM TO REDUCE THE ROOT MEAN SQUARE ERROR (RMSE). QUADTREE SEGMENTATION ALGORITHM IS USED TO DIVIDE THE IMAGES INTO SMALL BLOCKS. REGIONS WITH IMAGE DETAIL WILL BE SEGMENTED INTO BLOCKS WITH SMALLER BLOCK SIZE, AND THE BACKGROUND OF THE IMAGE WILL BE ASSIGNED LARGER BLOCK SIZE. AFTER THE PRE-PROCESSING OF QUADTREE SEGMENTATION, THOSE SALIENT FEATURES IN THE IMAGE SUCH AS EDGES, LINES AND REGION BOUNDARIES WILL BE SELECTED AS A PART OF FUSED IMAGES. AND THEN THE OTHER REGIONS WITHOUT SIGNIFICANT FEATURES WILL BE FURTHER PROCESSED USING WAVELET TRANSFORM. THE WAVELET TRANSFORMS OF THE INPUT IMAGES ARE APPROPRIATELY COMBINED, AND THE NEW IMAGE IS OBTAINED BY TAKING THE INVERSE WAVELET TRANSFORM OF THE FUSED WAVELET COEFFICIENTS. THE ADVANTAGE OF THIS THESIS IS TO GET BETTER QUALITY OF FUSED IMAGE BUT NOT NEED TO ADD MORE COMPLICATED ALGORITHM. THE EFFICIENCY WILL BE DEMONSTRATED IN THE SIMULATION RESULTS.

Keywords : IMAGE FUSION, QUADTREE SEGMENTATION, WAVELET TRANSFORM

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