Detection of the images temperature range using wavelet transform

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Abstract Image processing and analysis can be defined as an applied and technical structure to capture, refine, intensify and alter the observed images. With the advent of computers, some procedures have been developed for processing and analyzing digital images, and some sensors such as television camera and CCD arrays have become widespread. Compared to the early generations, advanced sensors led to the improvement of spatial resolution and intensity. Using simulation in multiple spaces leads to the development of combining information obtained different imaging systems. Today, the objective is to use the results of investigating in three-dimensional and four-dimensional spaces. As far as it is related to software, the guidance methods for knowledge are of increasingly importance. When such methods are performed up and down an object, a mathematical model is used to process the image in the target areas. When the bottom-up direction is used, the details, found by the image processing programs, are investigated to find their relationship with the mathematical model. If a time or spatial index is given to a set of measurements performed on a measurable phenomenon, some information can be obtained which specific information can be extracted. These information cannot be easily retrieved the main signal. One of the important transformations is wavelet transformation which transforms the signal the argument space into the frequency space. In this study, the temperature range of the images was investigated using wavelet transformation. Due to the advantages of wavelet transform over Fourier transform in terms of achieving maximum time-frequency accuracy in analyzing signal and image, and in terms of the capability of performing multi-resolution analysis, wavelet transform is widely used and is of great importance. The primary topics discussed in this study are introducing bank filter, using wavelet transform for introducing signal and temperature range of the image in the multi-resolution space. Then, different types of basic wavelet functions which create orthogonal, semi- orthogonal and non-orthogonal transforms, were introduced. Finally, the use of wavelet was introduced in

extracting image features, compression and enhancement, edge detection, and noise reduction. For this purpose, wavelet transform equations of the temperature range of images were written in MATLAB software. It was found that resolution and contrast of the images are not affected using wavelet transform while in the previous methods, this was not considered. In addition, using this method, the image noise is reduced greatly, and the accuracy of this method is greater than the previous methods. Using image processing method, the image is estimated more accurately, and the exact location of the image temperature range was obtained. In the former methods, only a temperature range was determined but in the image processing method, image can be detected no matter it is located.

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