

Investigation on several basic interpolation methods for the use in remote sensing application

ABSTRACT

Image from satellite is an example of remote sensing data. However, when the resolution of the available satellite image is too coarse and does not meet the required resolution, a process known as image re-sampling need to be employed, so a higher resolution version of the image could be obtained. Image re-sampling may involve interpolation, which is a process of allocating intensity value into a new generated pixel. Yet, interpolation method usually degrades the image quality. In this paper, five basic interpolation methods have been successfully implemented. These interpolation methods are nearest neighbor interpolation, bilinear interpolation, interpolation with smoothing filter, interpolation with sharpening filter, and interpolation with unsharp masking. The aim of this project is to find interpolation method that is suitable for remote sensing data. The method of our interest is the method that is easy to be implemented, but can preserve the quality of the data in term of sharpness and validness of the information. Based on the results, it is shown that all five interpolation methods tested in this research can produce good quality output when the resolution of input image is high. For low resolution input, only bilinear, smoothing filter and unsharp masking can preserve the quality of the image. However, this is only limited for interpolation with magnification factor less than 5. Bilinear, smoothing filter and unsharp masking are suitable to interpolate remote sensing data if the resolution of the input image is high enough.