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A Look at Image Interpretation and What It Can Do

P.AISWARIYA, T.KIRTHIGA,
Assistant Professor,
Sri Sarada Mahavidyalayam Arts & Science College for women,

ABSTRACT

In image analysis, information was taken from pictures by people before computer cameras and image processing methods came along. Expert image interpreters have built up their skills over many years by learning about the subject they are working with, being familiar with the area they are working in, and knowing how the remote sensing system that created the images they are working with works. This study first talks about the basics of picture analysis. It then talks about automating the extraction of features from data collected from space.This essay changes the big picture of image analysis and also works on projects and plans that will help with more study.

Keywords: Tasks, Elements, Image Interpretation Applications, and Visual Image Interpretation.

INTODUCTION

Image interpretation is the process of probing an aerial photo or digital remote sensing image and manually identifying the features in (Figure 1.1).

that image.The technique of image interpretation may be either visual or digital or combination of both. Both the interpretation techniques have merits and demerits and even after the digital analysis the output are also visually analyzed.

The extraction of qualitative and quantitative information which are in the form of maps, photographs of location, structures, buildings, functions and object relationships are defined as image interpretation. It's all done with the help of human experience and knowledge. Normally in remote sensing, the information extraction is categorized into three types namely Classification of image data using spectral, spatial and temporal information.The typical flow of the interpretation process is defined in the representation

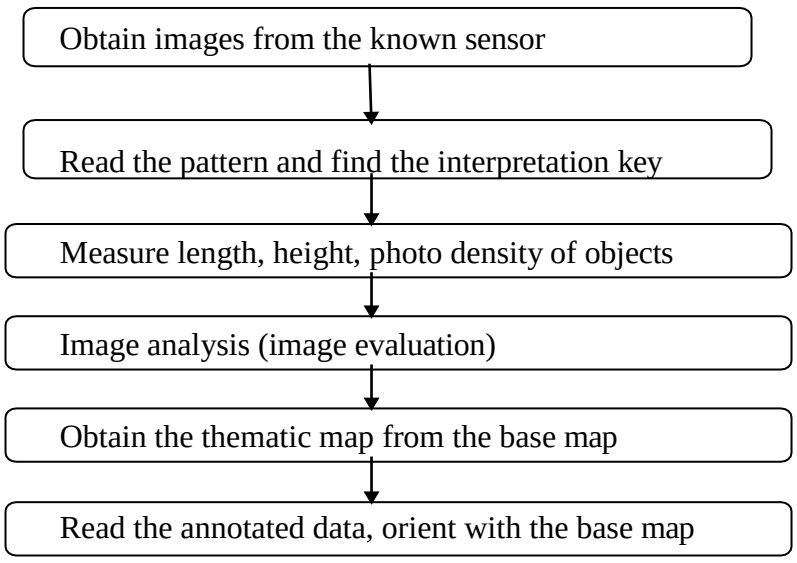

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Figure 1.1 Steps for Image Interpretation Process

IMAGE INTERPRETATION TASKS

To develop useful spatial information from images is the task of image interpretation. It includes

- **Detection:** such as search for hot spots in mechanical and electrical facilities and white spot in x-ray images. This is the first step of image interpretation.
- **Identification:** recognition of certain target. An example is to identify vegetation types, soil types, rock types and water bodies.
- **Delineation:** to outline the recognized target for mapping purposes. To map certain subjects combined together by using Identification and delineation. we call image classification when the whole image is to be processed by these two procedures,
- **Enumeration:** to count certain phenomena from the image. This is done based on detection and identification.
- **Mensuration:** to measure the area, the volume, the amount,and the length of certain target from an image.

BASIC ELEMENTS OF INTERPRETATION

The interpretation of satellite imagery and aerial photographs involves the study of various basic characters of an object with reference to spectral bands which is useful in visual analysis. The basic elements are shape, size, pattern, tone, texture, shadows, location, association and resolution are shown in the figure 1.2.

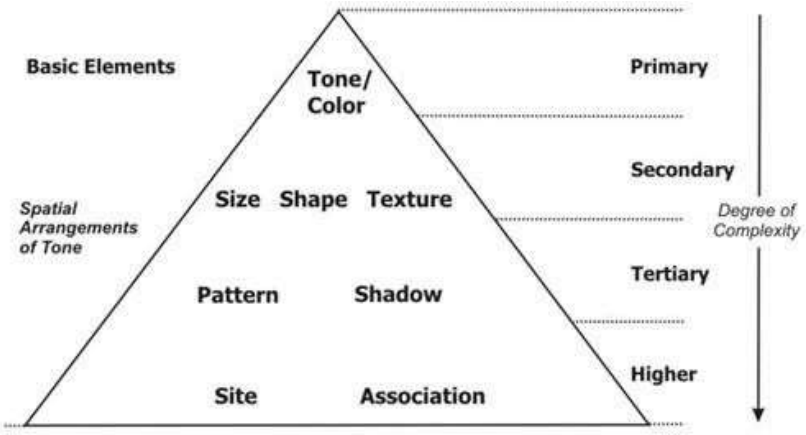

Figure:1.2 Ordering of image elements in image interpretation.

Image Tone, Grey Level, Or Multispectral Grey-Level Vector

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Human eyes can distinguish over 900 colors but only about 16 grey levels. Therefore, color images are preferred in image interpretation.Make use of all information available in each band of image, toreduce the image dimensionality

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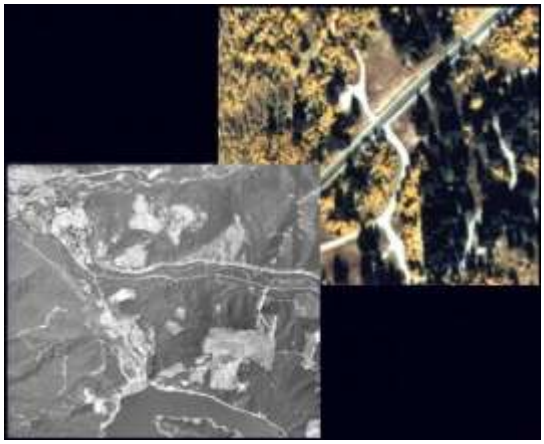

Figure 1.3: Tone (in the B&W image) allows for easy distinctions between roads, forests, harvest areas, water, and other elements.

Shape

Agricultural fields and human-built structures have regular shapes. These can be used to identify various targets.

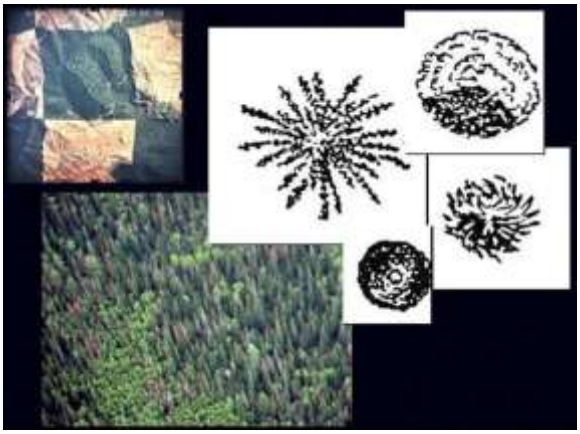

Figure 1.4: The shape of the tree crowns in the lower-left image is indicative of the type

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(deciduous/conifer) or even species of tree.

Image Texture

Texture is most important clue in image interpretation. It is very easy to identify the human interpreters to include it in their mental process. Most of the texture patterns are appear in irregular image.

Regular arrangement of ground objects. Examples are residential area on an aerial photograph and mountains in regular arrangement on satellite imagery.

Pattern

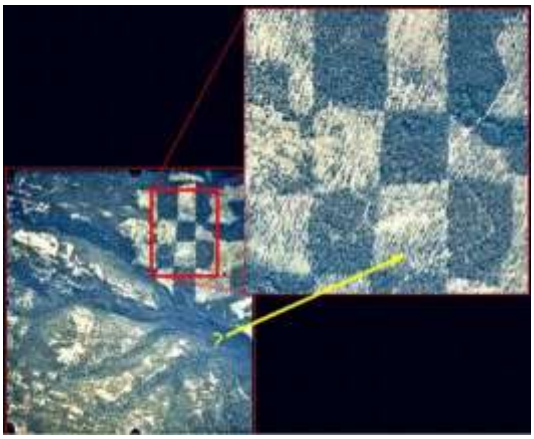


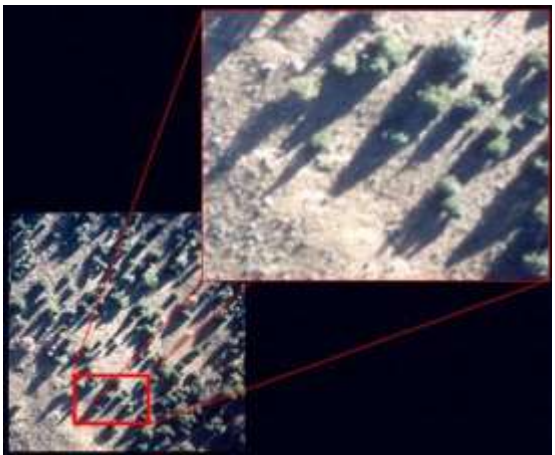
Figure 1.5: Pattern (in remote sensing) is a recognizable repetition of particular shapes.

Association

A specific object co-occurring with one more object is defined as Association. The example for association is outdoor swimming pool associated with a recreation center.

Shadow

Object shadow is very useful when the



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phenomenon under study have vertical variation. Examples include trees, buildings, mountains, etc.

Figure 1.6: Shadows cast by objects in the image can give the interpreter information about the shape and size of certain features in the image.

Size

Size of buildings can tell us about the type of land uses while sizes of tree crowns can tell us about the approximate age of trees.

TYPES OF IMAGE INTERPRETATION

The Aerial photographs and satellite imageries are interpreted visually. Similarly, digital data products or digital images are interpreted mathematically by using computer software. So, Remote Sensing data interpretation contains two types they are- 1) Visual Interpretation and 2) Digital Interpretation.

1. VISUAL INTERPRETATION:

To use the aerial photographs and satellite imageries are interpreted visually. A number of sophisticated instruments such as pocket stereoscope, mirror stereoscope are used to interpret aerial photographs and plotter is used for measuring area, height, slopes of different parts of earth photographed and also for plotting different objects.

2. DIGITAL INTERPRETATION

With the help of the computers, digital interpretation to facilitate quantitative analysis of digital data to the extract information about the earth.'Image Processing' is popularly known asDigital interpretation. Image processing contains the image correction, image enhancement and information extraction.

TOOLS AND APPLICATIONS

- **Rapid Photo Interpretation Tool**

Most of these problems can be mitigated by creating new classifications with multitemporal high resolution imagery, LiDAR and object based image analysis procedures, but these advanced products require high levels of skill, specialized software, and significant hardware investments. Ocular photointerpretation (PI) from high resolution aerial imagery is a direct observation approach that is a cost-effective and accurate way to conduct large area resource assessments.

- **Digitizing Tools**

A fundamental part of image interpretation projects is the process of digitizing the features identified on the image. In heads up digitizing, the image is displayed on the computer screen using a GIS software package, such as ESRI's ArcGIS, and the analyst draws polygons with a mouse delineating features of interest.

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- **Stereo Displays**

Stereo displays allow analyst to incorporate topographic variation into the analysis and to calculate information such as tree height. Stereo displays consisting of two images of the same location taken from slightly different angles.

In this paper we briefly reviewed the various elements and tools from its inception to the future.This review puts focus on the hot and promising areas of image interpretation. This paper provides a new perspective of a researcher regarding image interpretation.

CONCLUSIONS

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