Application of Modern Survey Technique like GIS, GPS, Remote Sensing for Better Precision

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Abstract: Modern technologies, such as Earth observation, GPS and improved geospatial information programs, make data collection easier and faster, but there are many problems and misinformation without proper treatment. The GIS capability can be used to use many different data types associated with the same location and integrate different sets of data into a single system. But when a new set of new data is transferred to GIS, the program does not include importing data, but it also includes data errors. The first step in dealing with the wrong problem is to understand and understand the limitations of the data used. The presentation of data from modern technologies often results in the accuracy and accuracy of the data required. In most cases, many small islands lack the human resources and capabilities of the Caribbean that cannot adequately challenge the tasks of contractors and consultants, and the accuracy of spatial geospatial data cannot be evaluated. This dissertation is examining the categories of images through MATLAB to find the best resolution for GPS, GPS, remote sensing satellite image.

Keywords: MATLAB, GIS, GPS, Remote Sensing, Satellite Signal, Global Storage System

1. INTRODUCTION

Many people using GIS data do not fully understand the way (last) collection of products. At the same time, the need for geospatial information requires data to meet the needs of multiple lists. New technologies, such as Earth observation, GPS, and improved software for geospatial information, make data collection easier and faster, but there are many problems and misleading without proper treatment. In most cases, many small islands lack the human resources and capabilities in the Caribbean that fail to challenge the contractors and consultants' tasks properly, it is not possible to assess the accuracy and accuracy of geospatial data.

1.1 Geographical Information System (GIS)

Rapid development of computer technology, information systems and the visual world makes data access to the physical and cultural world, and its use of study or problem solving. The introduction of modern technology has increased the use of computers and information technology in all aspects of local data processing compared to work methods. GIS can be defined as an integrated computer hardware and software system combined with program and human analysts that collectively supports spatial reference data capture, storage management, manipulation, analysis, modeling, and display.

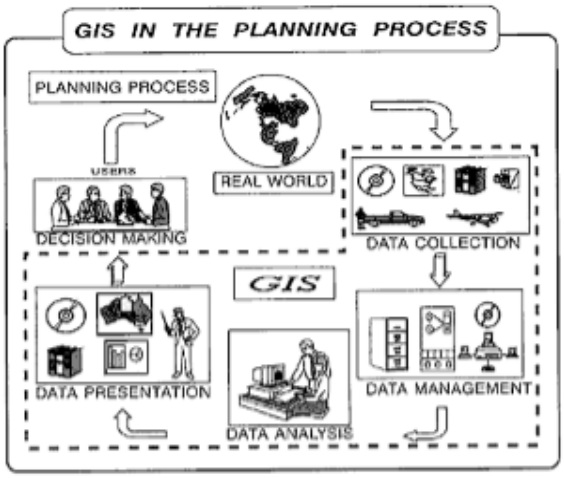

Fig: 1 GIS in planning process

1.1.1 Accuracy

Accuracy is often considered to be the most important part of the organization. When considering the information on maps or a set of digital data, the description of the destruction is difficult with real awareness in the world, concepts, and performance. . The closeness between the nature shown and the actual situation can be shown with a mean square resolution (RMS), indicating the degradation / location. Previous is often misleading as a number of distances in the democratic position. For example, GPS accuracy data depends on many factors. For example, the quality of the GPS receiver, the GPS features of the satellite, the surrounding environment (buildings, tree cover, valve, etc.) while data recording and even the weather. Whether GPS is stationary or transmitted (in aircraft or cars etc.), it is also different.

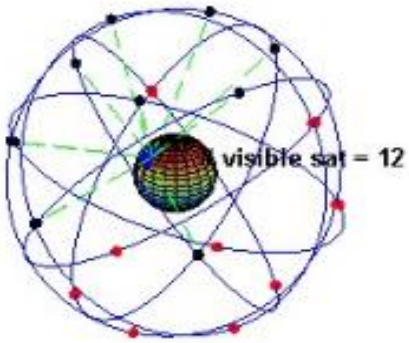

FIG: 2 GPS satellite constellation

1.1.2 Precision

The fact is that only the value of the measure is at a real cost, which is related to the resolution and the variable. That is, the amount of data shown in a specific area. To a certain extent, this is a method of measuring the location of the data.

1.1.3 Data Models

There are two types of data models: rosters and vectors. Both models have three different geometric data types. A point that represents position, a line that represents length, a polygon that gives information about circumference or area.

Raster model: The Raster data type representation uses a set of coordinated cells, and each cell is considered by the importance of using estimates.

Vector model: The image data model uses a portion of a line or a clearly defined point "x" and "y" links to identify places. Disposal materials are constructed by connecting the parts of aircraft that are described by the row of spiders.

1.2 GLOBAL POSITIONING SYSTEM (GPS)

The Global Positioning System (GPS) is a new technology that provides extraordinary precision and accuracy to collect mobility, measurement and GIS data. GPS offers 24-hour continuous 3D positioning one day a day. Three-dimensional nature of GPS measurement also allows for determining horizontal and vertical randomization in the same time and place (clip, 1996; Segall and Davis, 1997).

Fig: 3 Constellation of NAVSTAR satellites orbiting earth

The Space Segment

The space part consists of 24 Earth orbit NAVASTAR satellites. The satellites are arranged in six orbital planes each having four satellites at an interval of 60 degrees along the equator and at an interval of 55 degrees from the equatorial plane. They are at a distance of 12,000 kilometers, at a distance of 12 hours, with a stellar 12-hour period (determined by stars or stars), or about half of the world. Black IITs next satellite module has given the ability to measure between synthetic satellites to improve the reliability of high reliability and accuracy.

The User Segment

User base is a community of domestic and military consumers and suppliers. The user's section includes ground-based GPS receivers. The basic design is very easy, but the size and complexity of the receiver is very different. The normal adoption antenna and predictive predictions, radio signals microprocessors, control and display units, data storage units and power supply.

1.3. GPS Positioning Types

There are basically two different types of global positioning as described below:

Absolute Positioning

The positioning mode depends on a single receiving station. Unlike different stereotypes, GPS-called distribution of "autonomous" GPS because travel is not directly from the soil reference channel that makes it easy to fix the error, but it is done between satellites and the channel.

Differential Positioning

A compatible or alternative GPS also uses the immune system and a second recipient in a recognized location. This preparation requires a collection of error correction messages from the index recipient to continue the targeting points related to the highest points in the world.

Inherent sources of errors

GPS error errors from random noise, concerns are of great blunders.

Noise This error is usually associated with the problem of access to a few meters and is caused by the receiving signal and the sound of calls.

Bias This error is mainly due to the increase of the selective availability signal. The deliberate dismantling of the S / A signal is the same as a general variation of about 2 / C decision that might be possible (e.g., from 30 meters to 100 m). This is a change in low-frequency travel because all NAVSTAR satellites make different S / A codes. The dynamics in space can detect larger errors than 10 meters, and tropospheric factors such as heat, pressure and moisture change more than a meter. The ionosphere is delayed until 10 meters due to higher atmospheric aberrations.

Blunders User errors (including inappropriate data selection), software problems, failure to receive notification or partial control errors may result in system errors.

Surveying and Mapping

The GPS ratings measurement rate and adjustments that are suitable for job preparation provide enough tools to perform different measuring and calculating tasks. Using a differential global positioning system approach, it can be done accurately and in a timely manner.

Navigation

Using GPS navigation can save several hours on the site. Any feature, even if it is underwater, can be about 100 meters by entering the map link, entering the waypoints, and entering the exact location.

Remote Sensing and GIS

The GPS positioning can also be integrated into remote sensing. Using DGPP or motion technology, real-time or post-processing is the sensor to the location that can be presented on the image instead of its requirement.

1.4 REMOTE SENSING

Remote sensing is artistic and science to obtain information about opposition or feature without physical contact. People use far more insight into their everyday work through vision, hearing and smell. The collected data can take many forms, such as changes in the distribution of sound waves (e.g., sonar), changes in the distribution of force (e.g., gravimeter), changes in the distribution of electromagnetic energy (e.g., the eye), etc.

In other words, the departure is a different source of energy (EM) that is associated with energy, or features far away from different objects. It is identified by type or type of item, matter and local divide and it can be rated as 1975.

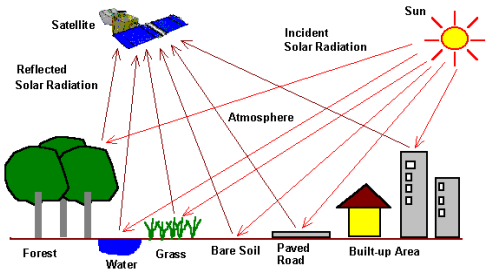

Fig: 4 Schematic representation of remote sensing technique

Remote sensing is widely viewed with large local and temporary frequencies. It is widely used widely on water survey, hydraulic conditions and flow signals, hydraulic signals, flood and dry warning and monitoring, loss of natural disaster conditions, environmental monitoring and urban planning.

1.4.1 Principles of Remote Sensing

Different items show different energy levels or different sizes of the use of electromagnetic spectrum. Depending on the nature of the strength or power of the energy and nature (angle event, size and width of the wave). An instrument in which something like this reflects reflecting or connected electromagnetic radiation, is called "sensor" (such as a camera and scanner).The vehicles used to carry the sensors are called "platforms" (e.g. aircraft and satellites).
Remote phases in the following view.

A. Electromagnetic radiation Sun or high-quality EMR source
B. Power transfer from source to object The creation and distribution of EMR during delivery
C. The intentional EMR connection and subsequent consideration and issue
D. Power transfers from an object to a company
E. Recording of power through sensor Pictures or not in pictures
F. Submission of recorded information to the world station
G. Processing data on digital or copy photographs
H. Data update

1.4.2 Characteristics of Real Remote Sensing Systems

The actual remote hearing system used for normal functionality and the State has a huge impact when compared to the next system.

Energy Source: The energy source of the original system is usually non-uniforms on different dimensions and is different from time. This has an important impact on the passive systems sensing remote. The sunshine of the sun's light appears time and space. Earthly things also release energy by different strengths. The actual remote control system requires a power source measurement.

The Atmosphere: The situation changes the distribution of spectrum and the strength of the transferred power (Figure 8). Depending on the product, sensor and sensing application. It needs calibration to eliminate or correct the environment.

The Energy/Matter Interactions at the Earth's Surface: Remote sensing view is based on a program that displays or removes power in a different way. However, spectral buildings can be like different types of material. This makes the difference difficult. In addition, most of the co-operation information about the strengths of the face of the earth is at first or unknown level.

1.5 ADVANTAGES AND DISADVANTAGES OF REMOTE SENSING

Advantages of remote sensing are:

- Provides data of large areas
- Provides data of very remote and inaccessible regions
- Able to obtain imagery of any area over a continuous period of time through which the any anthropogenic or natural changes in the landscape can be analyzed
- Relatively inexpensive when compared to employing a team of surveyors
- Disadvantages of remote sensing are:
- The interpretation of imagery requires a certain skill level
- Needs cross verification with ground (field) survey data
- Data from multiple sources may create confusion
- Objects can be misclassified or confused

1.6 REMOTE SENSING MAJOR APPLICATIONS AREA

This article describes various applications of this technology called remote sensing. After reading these apps, your perception of the satellite changes. The following are some of the main areas where remote sensing can help.

- Agriculture
- Forestry
- Weather
- Biodiversity

2. TECHNICAL METHOD USED

Current technology such as Remote Sensing, Geographic Information Systems (GIS) and Global Positioning System (GPS) can improve forest management methods. Accurate forest practices can be implemented using these techniques consistent with the SFM concept. For example, when implementing SFM to predict forest certification, forest managers are more thorough, accurate and documented about forest resources, landscape characteristics, and attributes that can be collected through remote sensing and GIS techniques it need information. This can be done accurately using GPS technology. All these are important elements of precision forestry. This thesis emphasizes the use of existing technology such as remote sensing, geographic information systems and global positioning systems.

2.1 NUMERICAL METHOD OF GPS TRACKING SIGNAL

The idea behind GPS is easy. If you know the distance from a point on the earth (GPS receiver) to the three GPS satellites and the position of the satellite, just apply the well-known ablation concept and then the point (or receiver) they can determine the location of did they have questions about how to get satellite distance and satellite position now. According to the teaching, only three thirds of three satellite tracks are followed at the same time. In this case, the recipient is in three parts of the ball. Each satellite has a distance of 1-satellite radius and focuses on that satellite (Fig: 5)

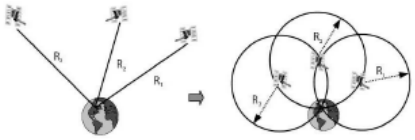

Fig: 5 Basic idea of GPS positioning

2.2 NUMERICAL EXPRESSION OF THE COORDINATES

The satellites called geostationary (satellites that are found in the world-class points) used over the past thirty years make it easy to identify the position of the tracking signal anywhere in the world. This is done by estimating the time it takes for the signal to move between the viewer and any satellite and change the distance between the two.

$$(x-x_1)^2+(y-y_1)^2+(z-z_1)^2=r_1^2$$
$$(x-x_2)^2+(y-y_2)^2+(z-z_2)^2=r_2^2$$
$$(x-x_3)^2+(y-y_3)^2+(z-z_3)^2=r_3^2$$
$$(x-x_4)^2+(y-y_4)^2+(z-z_4)^2=r_4^2$$

Here xi Meaning zi, is the known coordinates of space and satellite in x. As shown in Figure 3.2, z is the unknown coordinates of the observer on the earth. Subtract the first of these statements from each of the three statements. This removes the x quadratic name. ; is a set of non-initial rated values near x. Z:

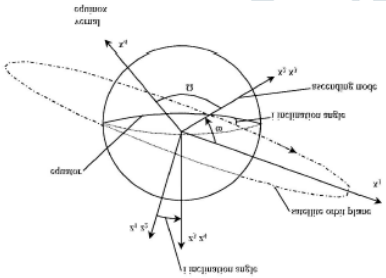

Fig: 6 Satellite and Observer in the Global Positioning System

$$(S)\begin{cases}2(x_2-x_1)x+2(y_2-y_1)y+2(z_2-z_1)z=r_1^2-x_1^2-r_2^2+x_2^2\\2(x_3-x_1)x+2(y_3-y_1)y+2(z_3-z_1)z=r_1^2-x_1^2-r_3^2+x_3^2\\2(x_4-x_1)x+2(y_4-y_1)y+2(z_4-z_1)z=r_1^2-x_1^2-r_4^2+x_4^2\end{cases}$$

This system can be solved by either Mathematical or MATLAB containing package for Gaussian elimination.

3. SIMULATION

3.1 GPS FOR THE UTILITIES INDUSTRY

An accurate, up-to-date map of the Service is important to the public company. The availability of these maps will help energy companies, gas and water to plan, build and maintain their assets. The GIS application can use the information collected to create a useful map of the task.

Fig: 7 GPS For The Utilities Industry

If GPS access is poor, like urban cities, it is easy to use a GPS-LRF system. This program is an effective tool for calculating the most used map. While the GPS receiver is always open to receive an acceptable signal, the LRF has crossed the separation of information (distance and distance) from service files as lighting fixtures. Processing software should be able to integrate GPS and LRF data.

3.2 GPS FOR CIVIL ENGINEERING APPLICATIONS

Civil engineering is often carried out in complex and unfinished areas, making it difficult for people to work effectively. The GPS ability to bring the total amount of real time to meter and the diameter of the cost in a cost-effective manner has significantly changed the engineering industry. Construction companies use GPS in many areas, such as road construction, civil engineering and vehicle management.

3.3 GPS FOR LAND SEISMIC SURVEYING

Oil and gas testing requires environmental analysis for geological geography. In the ground-based craft, acoustic low power is transported into the underground line. Acoustic energy is often chosen as a mechanical oscillator that includes a metal plate mounted on a truck.

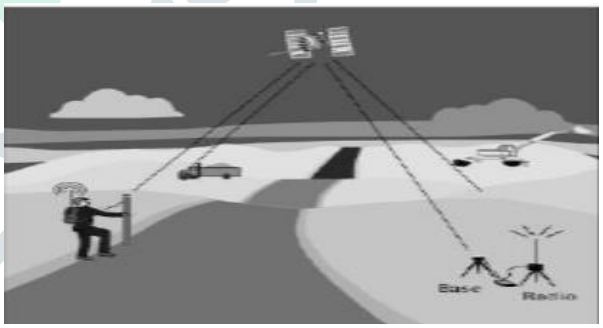

Fig: 8 GPS for Land Seismic Surveying

When acoustic energy (signals) pass through various substances, it is affected by the material of the rock. The part of the signal appears at the top of the fence. Expected power can be found by a special natural tool called geophones in a region known from the source of energy in geodesics.

3.4 GPS FOR MARINE SEISMIC SURVEYING

Oil and gas testing requires environmental analysis for geological geography. In the ground-based craft, acoustic low power is transported into the underground line. Acoustic energy is often chosen as a mechanical oscillator that includes a metal plate mounted on a truck. The plate is pressed against the soil and vibrates to create acoustic energy. In difficult areas, explosives are still used as a source of energy.

3.5 GPS FOR VEHICLE NAVIGATION

When traveling in unfamiliar areas, motorists often use roadmaps on the route of the route. However, in addition to unemployment, it is not safe to use paper maps to locate places, especially in busy areas. The new technology that incorporates GPS and digital road networks and computer programs has been developed to provide direction for the push of a button. GPS role in this technology is to continue to identify the position of the car. In restricted areas such as urban fish and routes, GPS is compatible with soil systems such as DR programs to overcome the GPS signal disruption. The program is right in a short time. GPS-determined car locations are installed on digital traffic police that include digital information such as street names and directions, business listing, airports, advertising and other relevant information for its details.

4. RESULT

This thesis investigate the core methodology of image analysis for the structure taken from satellite. The image taken through satellite is very important for the calculation of real time information and the given attributes that come out through image. For this analysis the MATLAB-2013 has been used to investigate the finding that has been taken for the consideration of the analysis. Integration of GIS, GPS, and Remote Sensing for Better Precision has been widely used in survey of various application in recent time.

Fig: 9 Original Image

Figure 10. Gray Scale Image

A picture of grayscale (or gray level) is only when colors only go gray. The reason for separating such images into any other type of color picture is that less information needs to be provided for each pixel. In fact, the 'gray' color is one where the red, green and blue parts are all the same on the RGB space, so it is only necessary to specify the one-peak height of each pyramid, against the three objectives required to clarify each pixel with a color-colored image.

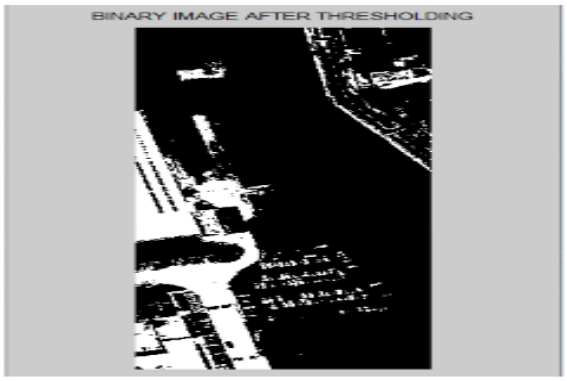

Fig: 11 Binary Image

A binary picture of a digital photo with only two pixels per pixel. Usually, two colors used for the picture binary are black and white. The color used for the item (s) in the image is the color before the rest of the image is the background color. In the document scanning industry, this is often referred to as "bi-tonal".

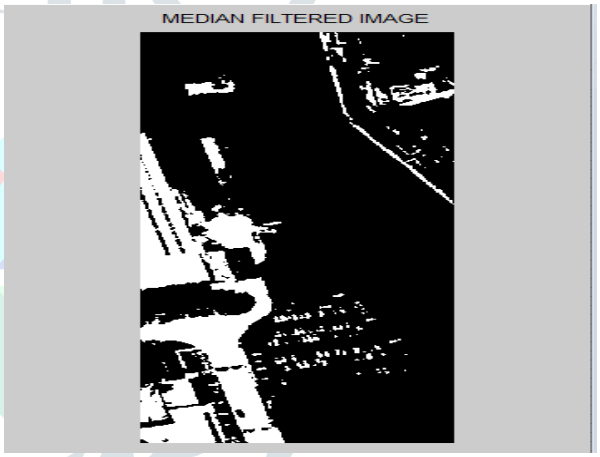

Fig: 12 Median Filtered Image

The Median Filter is a non-compatible digital filtering process, commonly used to extract audio from a photo or signal. Such mitigation is a common process of processing to improve later analyzes (for example, the edge of the image). Median filtering has been used extensively for digital screening because, under certain circumstances, it keeps parts while deleting sound (but see conversation below), and you have apps to use the signal.

5. CONCLUSION

The GPS concept is based on time. Satellite is a very stable harmony atomic clock Watch each other and earth. Fix the original day you keep on the ground every day. Then, Satellite position is monitored correctly. GPS receivers are also watches, but they are not synchronized and stable with real time. GPS synthetic current time and transfer Location. The GPS receiver monitors several artificial comparisons and equality to determine their precise location. Real-time recipient and its deviation must be at the field of viewing at least four artificial refrigerators. Count four unknown (three position quarters and watch squad for planet time). Global storage system it provides a targeted satellite signal that can be operated on the GPS recipient to enable the recipient of the position, speed and time. This thesis investigate the image categories through MATLAB

for finding the Better Precision of GIS, GPS, Remote Sensing of satellite image.

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