Remote Sensing

Definition:

Remote sensing is a process that involves the collection of information about an object or phenomenon without physical contact, done from a distance often using satellite or aerial platforms.

Key Components:

1. Sensor: Device or instrument used to collect data, eg cameras, spectrometers, radar systems etc.

2. Platform: Which vehicle carries the sensor for example satellites, aircrafts, drones etc.

3. Data Transmission: The movements of collected data from the sensor to the ground stations for further analysis.

Types of Remote Sensing:

1. Passive Remote Sensing:
This relies on external sources of radiation such as sunlight and measures reflected or emitted energy (eg optical sensors capturing visible light).

2. Active Remote Sensing:
It uses its own energy source like radar and measures the reflected signal (useful in cloudy conditions and for mapping topography).

Electromagnetic Spectrum:

One must understand the electromagnetic spectrum to study remote sensing. It includes various forms of energy like radio waves, microwaves, infrared, visible light, ultraviolet rays, x-rays and gamma rays.

Applications:

1. Environmental Monitoring: Tracking deforestation; land use changes; monitoring ecosystems.
2. Agriculture: To access crop health; monitor irrigation; predict yields.
3. Urban Planning: Analyzing urban growth; infrastructure development; land-use planning.
4. Disaster Management: Assessing impact of natural disasters e.g earthquakes; floods; wildfires.

Image Interpretation:

1. Resolution:

- Spatial: Level of detail in the image.
- Spectral: Number and size of spectral bands in the sensor.
- Temporal: time interval between image acquisitions

2. Enhancement Techniques:

- Image enhancement improves visualization e.g contrast stretching or histogram equalization

Challenges:

1. Cloud Cover:
It limits visibility in optical sensors
Radar and microwave sensors are less affected

2. Cost:
Some applications may be prohibitive due to satellite and sensor costs

3. Data Interpretation:
It requires expertise in image analysis and interpretation

Related posts:

1. RGPV BCE PYQs
2. Explain I/O devices in detail with suitable examples
3. Explain memory and type of memory in detail.
4. Define algorithms. What is the need of algorithms ? Describe three benefits of algorithms.
5. Explain procedure-oriented programming with examples.
6. Explain the following: Data Type, Tokens, Variables, Operator
7. Explain data structures in detail.
8. Define objects and classes. can a class in C++ have more than one constructor with the same name? Justify your answer with suitable example.