IFT 530-Final Project Summary

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Team 26:

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Project Title: Remote Sensing Data Repository

Project Summary:

The objective of the Remote Sensing Data Repository is to establish a unified database for the storage and administration of diverse remote sensing data acquired from satellite imagery, aerial photography, and comparable origins. This repository will serve as a valuable resource for researchers, environmental advocates, urban planners, agricultural specialists, and other relevant parties who depend on remote sensing data for analytical, monitoring, and decision-making purposes.

Details of Information Stored:

Satellite Imagery: This includes data such as satellite name, date of capture, sensor type, resolution, and geographic coordinates. Additionally, it may include metadata like cloud cover percentage, sun angle, and image processing status. This information is crucial for understanding the source and quality of the imagery.

Aerial Photography: Information related to aerial photography, including flight date, camera type, altitude, and coordinates. It may also include details about the aircraft and any processing applied to the images.

Environmental Parameters: Data on environmental parameters such as temperature, humidity, vegetation indices, land cover, and soil moisture derived from remote sensing imagery. These parameters provide valuable insights into environmental changes and ecosystem health.

Geospatial Data: Geographic information such as boundaries, administrative divisions, terrain elevation, and land use classification derived from remote sensing data. This data aids in spatial analysis, modeling, and decision-making processes.

Sensor_Details: This table stores information about the sensors used in capturing remote sensing data, including satellite imagery and aerial photography.

Image_Processing_Log: This table tracks the processing history of remote sensing images, including satellite imagery and aerial photography.

Region_Boundaries:This table stores boundary information for regions derived from remote sensing data, such as administrative boundaries, land cover classifications, or ecological zones.

Data_Providers: This table contains information about the providers of remote sensing data, including satellite imagery, aerial photography, and environmental datasets.

Satellite_Imagery:

Column Name	Data Type	Size	Null/NOT Null	Constraint	PK	Purpose of the column
satellite_id	int		NOT Null		Yes	Unique identifier for the satellite
satellite_name	varchar		NOT Null			Name of the satellite
capture_date	date		NOT Null			Date of image capture

sensor_type	varchar		NOT Null			Type of sensor used
resolution	numeric		NOT Null	> 0		Resolution of the image
latitude	numeric		NOT Null			Latitude of image location
longitude	numeric		NOT Null			Longitude of image location
cloud_cover_percentage	numeric					Percentage of cloud cover (optional)
sun_angle	numeric					Sun angle during capture (optional)
processing_status	varchar					Status of image processing (optional)

Aerial_Photography:

Column Name	Data Type	Size	Null/NOT Null	Constraint	PK	Purpose of the column
photo_id	int		NOT Null		Yes	Unique identifier for the aerial photo
flight_date	date		NOT Null			Date of the flight
camera_type	varchar		NOT Null			Type of camera used
altitude	numeric		NOT Null	> 0		Altitude of the flight
latitude	numeric		NOT Null			Latitude of photo location
longitude	numeric		NOT Null			Longitude of photo location
aircraft_details	text					Details about the aircraft (optional)

processing_details	text					Details about image processing (optional)

Environmental Parameters:

Column Name	Data Type	Size	Null/NOT Null	Constraint	PK	Purpose of the column
parameter_id	int		NOT Null		Yes	Unique identifier for the parameter
parameter_name	varchar		NOT Null			Name of the parameter
value	numeric		NOT Null			Value of the parameter
unit	varchar		NOT Null			Unit of measurement
latitude	numeric		NOT Null			Latitude of measurement location
longitude	numeric		NOT Null			Longitude of measurement location
timestamp	timestamp		NOT Null			Timestamp of measurement

Geospatial_Data:

Column Name	Data Type	Size	Null/NOT Null	Constraint	PK	Purpose of the column
data_id	int		NOT Null		Yes	Unique identifier for the geospatial data
data_type	varchar		NOT Null			Type of geospatial data
source	varchar		NOT Null			Source of the data
description	text					Description of the data

latitude	numeric		NOT Null			Latitude of data location
longitude	numeric		NOT Null			Longitude of data location

Sensor Details:

Column Name	Data Type	Size	Null/NOT Null	Constraint	PK	Purpose of the column
sensor_id	int		NOT Null		Yes	Unique identifier for the sensor
sensor_name	varchar		NOT Null			Name of the sensor
sensor_type	varchar		NOT Null			Type of sensor
spectral_range	varchar					Spectral range of the sensor
resolution	numeric		NOT Null	> 0		Spatial resolution of the sensor
vendor	varchar					Vendor of the sensor

Image_Processing_Log:

Column Name	Data Type	Size	Null/NOT Null	Constraint	PK	Purpose of the column
log_id	int		NOT Null		Yes	Unique identifier for the log entry
image_id	int		NOT Null	References Satellite_Imagery.satellite_id		ID of the associated image
process_date	date		NOT Null			Date of the processing
process_type	varchar		NOT Null			Type of processing

Column Name	Data Type	Size	Null/NOT Null	Constraint	PK	Purpose of the column
processor_name	varchar		NOT Null			Name of the processor

Region Boundaries:

Column Name	Data Type	Size	Null/NOT Null	Constraint	PK	Purpose of the column
boundary_id	int		NOT Null		Yes	Unique identifier for the boundary
region_name	varchar		NOT Null			Name of the region
boundary_type	varchar		NOT Null			Type of boundary
boundary_geometry	geometry		NOT Null			Geometry of the boundary

Data_Providers:

Column Name	Data Type	Size	Null/NOT Null	Constraint	PK	Purpose of the column
provider_id	int		NOT Null		Yes	Unique identifier for the data provider
provider_name	varchar		NOT Null			Name of the data provider
contact_person	varchar		NOT Null			Contact person of the provider
email	varchar		NOT Null			Email address of the provider
phone_number	varchar		NOT Null			Phone number of the provider