

Real-Time Global Satellite Imagery Map Service by MapObject

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MapObject is commonly used as a tool for developing GIS. However, MapObject 2.0 cannot manage and serve a large amount of real-time satellite imagery map.

Satellite imagery map service is a form of geographical information service to show satellite image of any region on the Earth.

MapObject 2.0 adds satellite images to the theme layer, which makes it difficult to manage the bulks of global satellite images. When there are too many pictures, the memory is overloaded and the images cannot be displayed promptly.

We introduced a new method of loading the satellite imagery maps – displaying the satellite images and connecting to the satellite imagery database.

The UML composition schema of the class for loading and adding satellite imagery is shown in Fig. 1.

The function of GImageRender is to get the satellite image from the satellite imagery database and display it.

The display function that is integrated in MapObject 2.0 can, of course, show the satellite images; however, rendering is not prompt enough.

Therefore, in order to make rendering faster, we have introduced the method of loading the satellite images required by the memory.

ImageMap class inherited the Map class of MapObject and can be connected with MySQL databases. (Fig. 2)

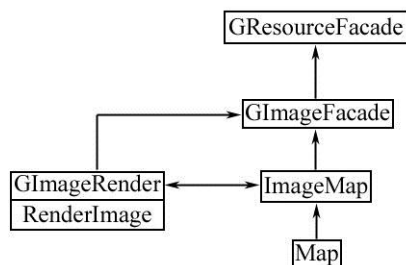


Fig 1. UML schema of the class for adding imagery

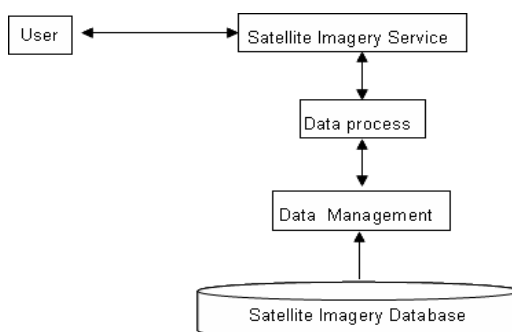


Fig 2. The composition of real-time satellite imagery service

As in Fig 2, the user sends request for a satellite image to the server and downloads the image from the satellite imagery database.

Satellite image maps are stored in the database in different layers and the data structure is oriented to making it convenient for the users to search the data. The satellite imagery maps are converted into files with *.jpg extension and stored in the MySQL databases.

The satellite images for real estate management are stored in Layer 18 and its resolution is more than 25cm. These image files are large in size and they are compressed with JPEG compression methods before submission by network. Compression is done by using the wavelet transformation method.

The compressed image is converted into the original satellite image file while being processed and then submitted to the user.

Fig. 3 shows the geographical representation by real-time satellite imagery service.



Fig. 3. Example of the real-time satellite imagery map service

With increased display speed, this method makes it possible to realize the real-time global satellite imagery map service.

Conclusion

This method can be applied to GIS applications.

References

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