

Master Project: Removing Shadows from the Aerial Optical Images



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Context

Optical satellite images contain parts that are in shadow. Depending on the time of the photography, the size and location of the shadows vary, but they exist. Although the shadows help the viewer to better realize the real 3D shape of the terrain, they limit the lighting in the more sophisticated visualizations. For example, in an application that simulates the daylight over the hours of a day, the shadows created by the lighting algorithm conflict with the shadows embedded in the image. Therefore, the satellite images should be analyzed, the shadows detected, and compensated.

Assignment

In this project, an application will be developed that takes satellite images of the earth as input and detects the shadows using the information of the image and extra information that is available, such as the elevation model, infrared images, etc. Then, the application corrects the color of the shadows based on the current color value of the shadow and the surroundings.

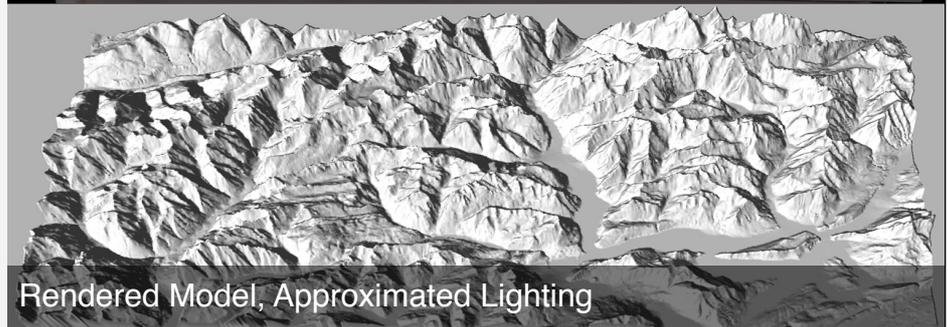
The corrected images will be used in GeoTable, where a dynamic lighting system will be implemented to show how the shadow-correction process improves the flexibility of using those images in different lighting situations.

Requirements

Interest in computer graphics and geographic visualization. This project has to be done as a group project. If possible, all participants should have experience with OpenGL, optimally taken from one of the graphics courses.



Physical Model, Real Lighting



Rendered Model, Approximated Lighting



Rendered Model, Approximated Lighting, Embedded Lighting

Work Load

- 40% theory
- 50% implementation
- 10% testing

Student Project Type

This topic can be done as a Master Project in a group of 2-3 persons. Goals are adjusted depending on the project type and the number of students.

Supervision

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Contact

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