Master Thesis

Analysis of cartographic map designs

The map projection specifies the mathematical rules that determine the position of real-world objects in the coordinate system of the flatten map. With small-scale maps, the approximation of the earth's shape as a sphere is sufficient, but even then it is not possible to transform the surface of the sphere into a flat reference system without changing the neighboring geometry of these objects. Different map projections try to minimize or optimize these inevitable distortions depending on the map usage.

Your work will be to development a computer program to qualitative investigation of map projections.

As part of the master's thesis, a program must be developed that allows:

- depict a freely selectable section of the earth's surface with different projections,
- to indicate its distortion properties numerically and graphically,
- to optimize existing mapping parameters, and
- to compare individual projections for the selected section quantitatively.

For this purpose, a suitable modular program structure has to be defined and a GUI has to be set up to control the program. The basic program modules are to be developed and tested. Existing software code C++ or C can be used.

Previous knowledge in object-oriented programming, GUI and graphics is desirable, well-founded knowledge in flat and spherical trigonometry as well as differential and integral calculation are necessary.

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