DESIGNING PHOTO-REALISTIC AND ABSTRACT MOUNTAIN MAPS FOR A 3D MAPPING STUDY

Matevž Domajnko, Mojca Kosmatin Fras And Dušan Petrovič

UNIVERSITY OF LJUBLJANA, FACULTY OF CIVIL AND GEODETIC ENGINEERING
JAMOVA 2, LJUBLJANA, SLOVENIA.
Main tasks (on mountain maps) are to estimate:
- the difficulty level of mountain paths,
- approximate length of the path,
- height differences and
- the time needed to complete the path.

Mountain 3D maps:
- Perfect for less skilled users.
- Enable direct perception of the vertical character of the depicted area
Trends in 3D map design

Photo-realistic 3D map
- Led by theory of computer graphics.
- Suitable for unskilled and younger users

OR

Abstract 3D map
- Lack of cartographic principles /cartographic language (Häberling in 2003 and Petrovič in 2001 set guidelines)
- Effective cartographic communication
Key features

Photo-realistic 3D map
- Demands large number of details in terms of shape and color.
- High geometrical and graphical details.
- Very realistic appearance.

OR

Abstract 3D map
- Employs cartographic generalization and cartographic abstraction.
- Expressive, clear and aesthetic 3D map
**User study on 3D map design**

The aim is to evaluate the influence of different levels of abstraction in 3D representations for cartographic communication.

**Hypothesis:**

*Abstract 3D geovisualizations are more effective for cartographic communication for mountainous purposes than photo-realistic 3D geovisualizations.*
The test area

Pohorje highlands

- Above Maribor, the second biggest town
- Ski center (world cup women)
- Hiking trails
- Bicycle riding (downhill, mountain bicycling)
- Adrenaline park
- Very popular area, a lot of visitors
Design issues on a test 3D maps

Photo-realistic 3D map

- Similar to the real appearance of the presented objects and phenomena
- Require more time and technical skill in order to achieve a high level of realism
Design issues on a test 3D maps

Abstract 3D map

To create an expressive, clear and aesthetic 3D map we followed various cartographic theories:

- Petrovič (2003) - Cartographic Design in 3D maps
- Glander’s and Döllner’s (2007) techniques for:
  • Generalization of 3D building groups,
  • Vegetation block model with coarse edge-line and coarse surface,
  • Cut-out of cell polygons
Comparison

Photo-realistic 3D map

Abstract 3D map
Types of 3D maps for mapping study

- Orthophoto overlay
- Topographic 2D map overlay
- Photo-realistic 3D map
- Abstract 3D map
Study

http://kartografi.si/mountainCartography/anketa_VR.html
Conclusions

Expected time of map study
October to December 2012

You all are kindly invited to contribute to study!