



8th Cartography and Geoinformation Conference
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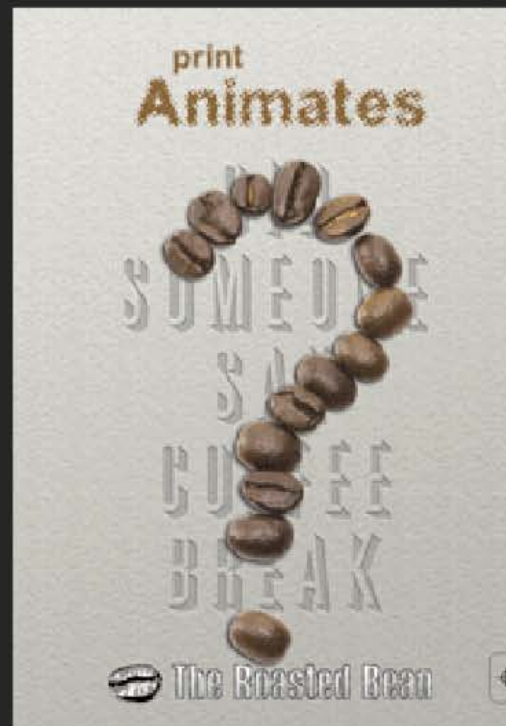


POSSIBILITIES FOR APPLICATION OF LENTICULAR PRINT IN THEMATIC CARTOGRAPHY

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LENTICULAR IMAGES



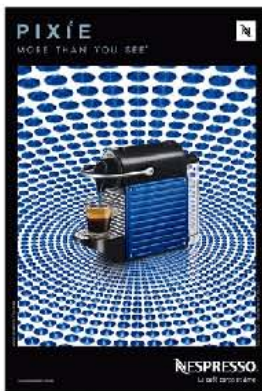
Lenticular Print Technology

Printed images with an illusion of depth or the ability to change or move as the image is viewed from different angle

- displaying multiple depictions
- visualizing dynamic processes
- presenting objects three-dimensionally



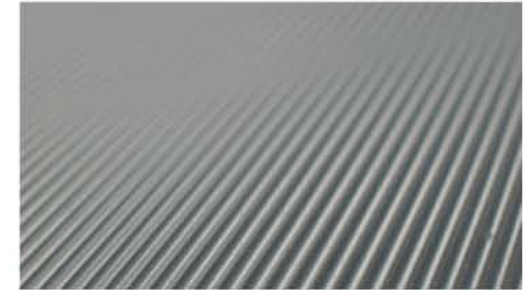
Potential applications in thematic cartography?



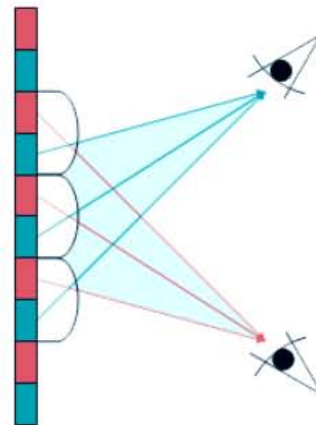
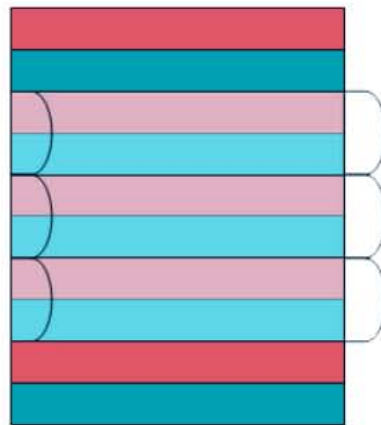
Principles of the Lenticular Print

Lenticular sheets

→ series of cylindrical lenses
molded in a plastic substrate



How does a lenticular lens work?



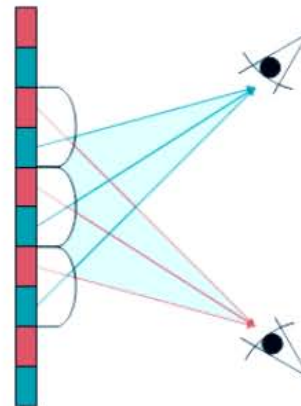
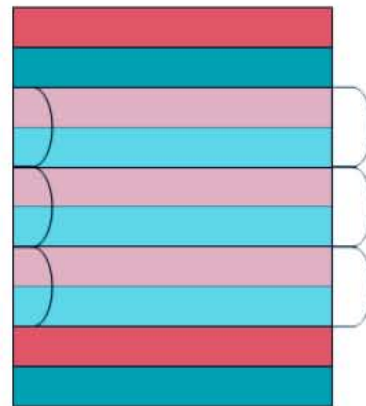
- the lenses refract the images beneath them
- as the point of view changes, the image you see changes

Lenticular Effects and Cartographic Representations?

→ molded in a plastic substrate



How does a lenticular lens work?



- the lenses refract the images beneath them
- as the point of view changes, the image you see changes

Lenticular Effects and Cartographic Representations?

2D flip, morphing, animation (motion), zooming

3D spatial view

Lenticular Effects and Cartography

Flip Effect

How it works?

- two (or more) different pictures are used and the lenses are designed to require a relatively large change in angle of view to switch from one image to another

Application in Thematic Cartography?

- visualization of several layers on the same area
- analytic visualization of spatio-temporal phenomena

comparisons, relations, time slices





Map of Manhattan

integration of street plan + subway situation + tourist neighborhoods

Panamap Manhattan by Urban Mapping, Inc, 2008

<http://www.panamap.com>

Lenticular Effects and Cartography

Flip Effect

How it works?

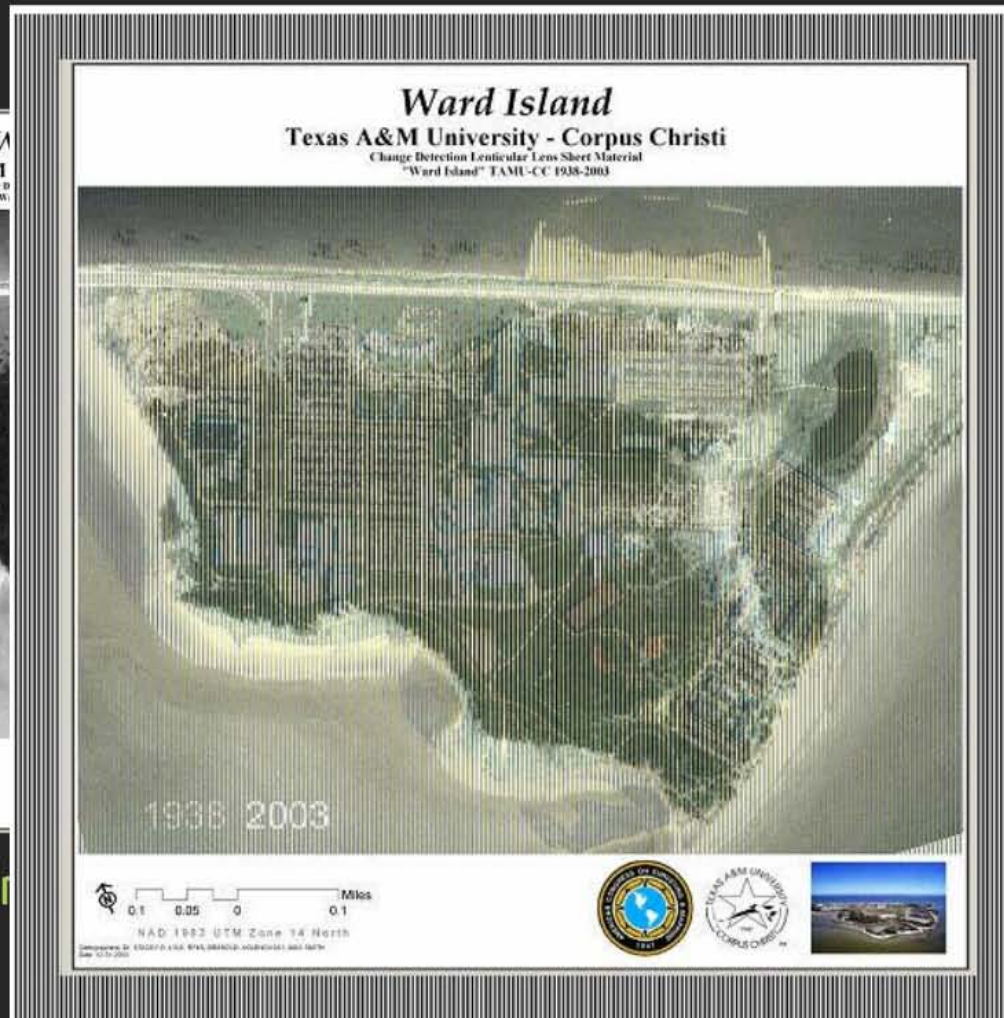
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comparisons, relations, time slices





Map of Ward Island, Texas A&M University-Corpus Christi, 2004
comparison of two time-cuts of the spatial development of a region

Lenticular Effects and Cartography

Flip Effect

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Lenticular Effects and Cartography

Morphing Effect

How it works?

- the distance between different angles of view is "medium", so that while both eyes usually see the same picture, moving a little bit switches to the next picture in the series
- many sequential images used, with only small differences between each previous image and the next

Application in Thematic Cartography?

- suitable to represent a series of spatial events

dynamics, movements, spatial change



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Application in Thematic Cartography?

- suitable to represent a series of spatial events

dynamics, movements, spatial change 

Examples?

Map of

- growth of a town
- diffusion processes
- migration
- transportation movements

the use of lenticular effects (morphing) is hardly worth it 

Lenticular Effects and Cartography

3D Effect

How it works?

- each eye sees its own version of the same scene, each taken from a slightly different angle so the brain perceives the scene in three dimensions

Application in Thematic Cartography?

- 3D relief presentations
- simultaneous depiction of relief and thematic mapping (land surface + diagrams)

spatial viewing becomes possible without
the use of any additional viewing aids



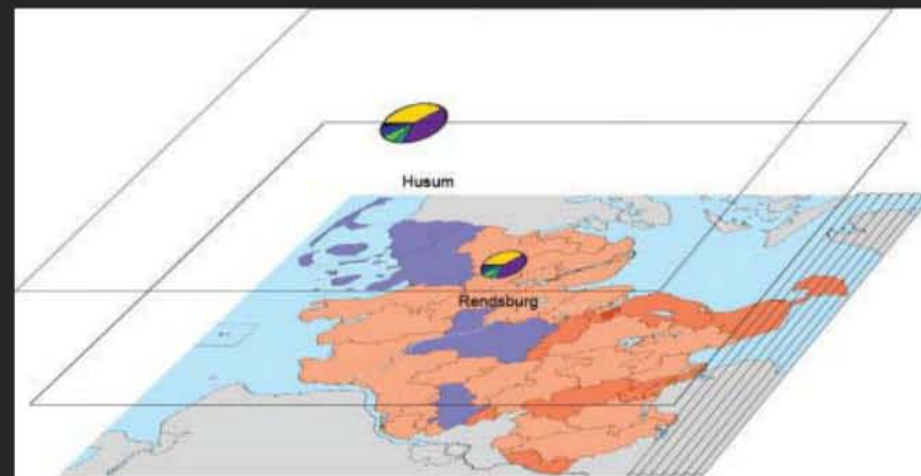


3D relief presentation of Velky Javornik, Beskydy

Lenticular postcard, 2010
<http://www.mapdesign.si>



combination of a thematic map with 3D relief information



map elements can be positioned higher (closer to the viewer) and in different levels

Lenticular Effects and Cartography

3D Effect

How it works?

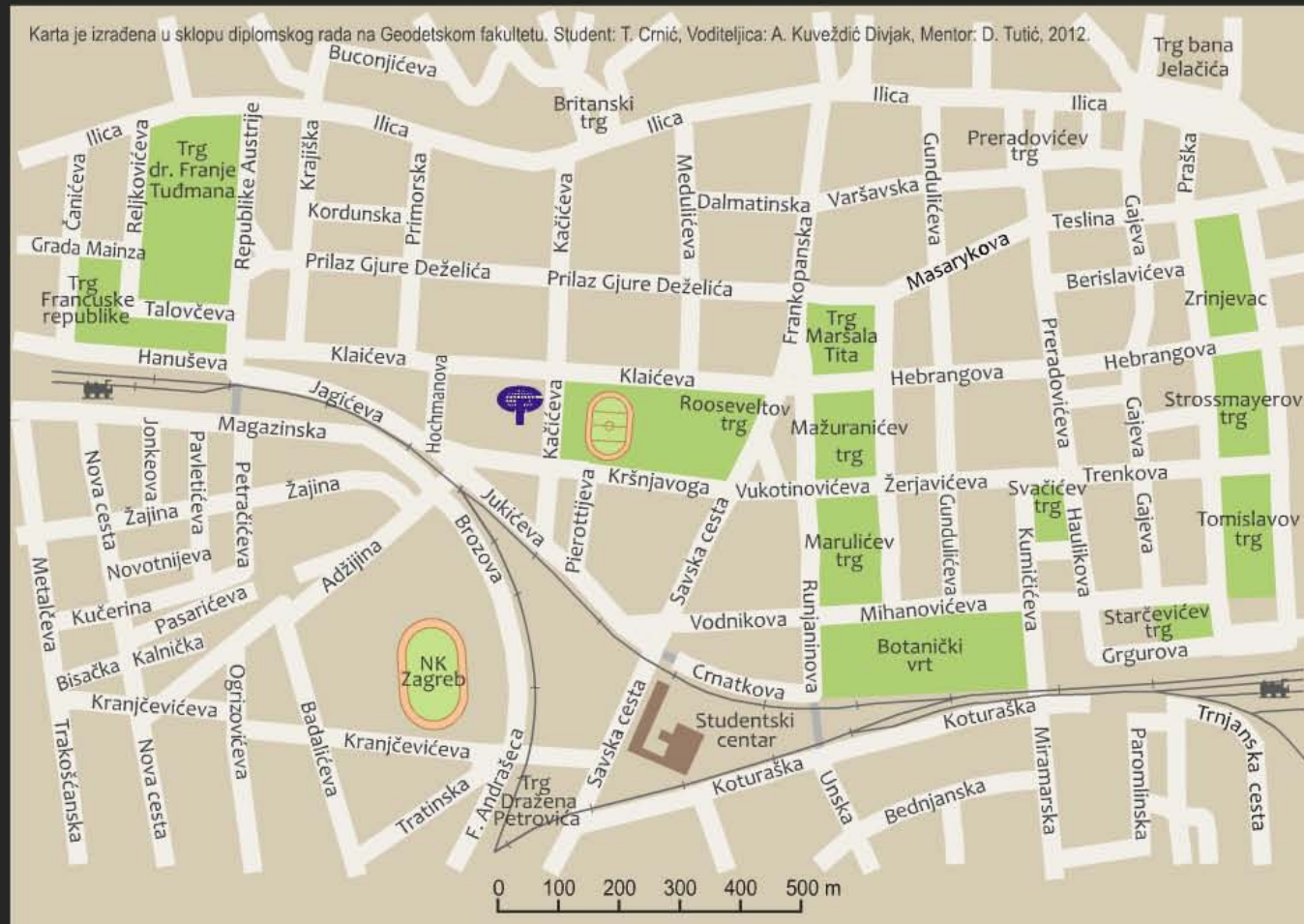
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Lenticular Map of the surroundings of the Faculty of Geodesy

- allows user to see spatial information separately and to see relations and dependencies of phenomena by changing the view





graphic density, content overload, bad legibility

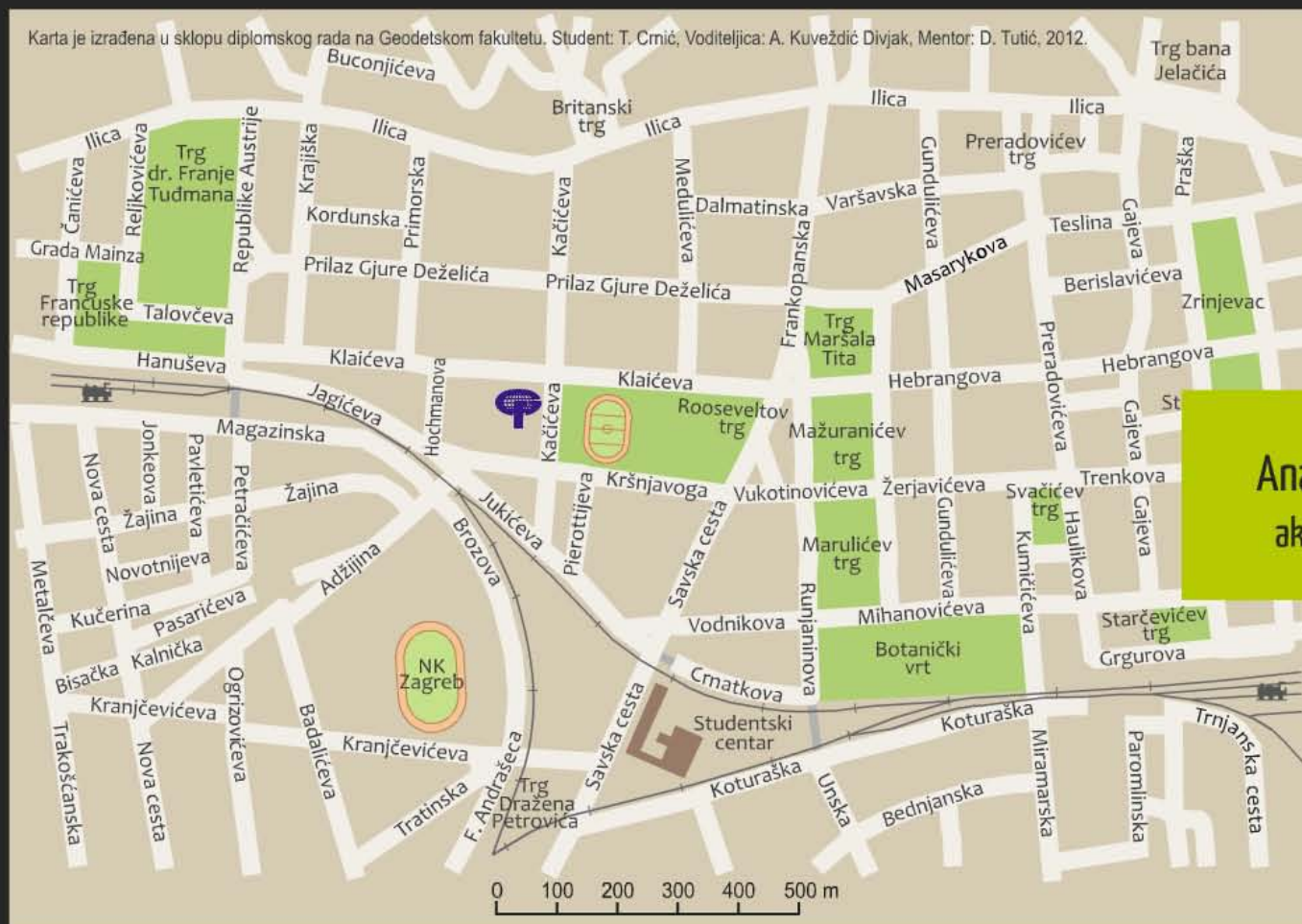
Conclusion

Lenticular Print in Thematic Cartography?

- extensive possibilities of application
 - displaying multiple depictions
 - visualizing dynamic processes
 - presenting objects three-dimensionally
- when designing lenticular representations cartographers must be aware of the restrictions of the lenticular medium and follow the basic cartographic principles



Thank You for Your Attention!



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