

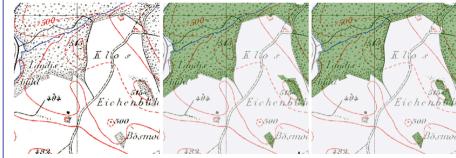
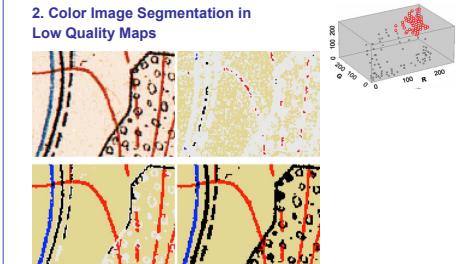
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<p>SUMMARY OF RESEARCH ACTIVITY</p> <p>Past Experience</p> <ul style="list-style-type: none"> ✓ 1996-2000 B.B.A. Information Management <i>National Taiwan University, Taiwan</i> ✓ 2003-2004 M.S. Computer Science <i>University of Southern California, USA</i> ✓ 2007-2010 PhD Computer Science (under Craig Knoblock) <i>University of Southern California, USA</i> <p>Research Topics</p> <p><i>Cartographic Information Extraction</i></p> <ul style="list-style-type: none"> ✓ <i>Text recognition</i> ✓ <i>Raster-to-vector conversion</i> <p><i>Geographic Information Science</i></p> <ul style="list-style-type: none"> ✓ <i>Geospatial data integration</i> ✓ <i>Conflation</i> 	<p>INTERESTS IN GREC 2011</p> <p>Map Processing</p> <ol style="list-style-type: none"> 1. Raster-to-vector conversion 2. Symbol recognition 3. Text/graphics separation
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Eighth IAPR International Workshop on Graphics Recognition - GREC 2009 (La Rochelle, France), July 22-23, 2009

IAPR TC10

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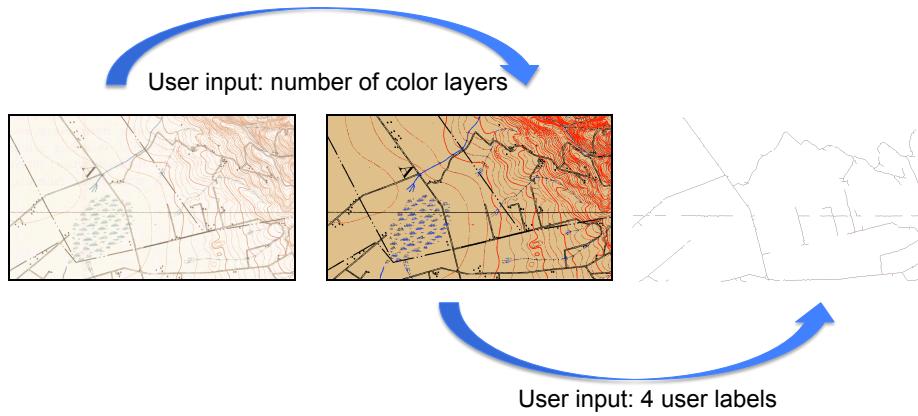
<p>SUMMARY OF RESEARCH ACTIVITY</p> <p>Past Experience</p> <ul style="list-style-type: none"> ✓ 1996-2002 M.Sc. Forest Sciences <i>Dresden University of Technology</i> ✓ 2002-2005 PhD Geography <i>University of Zurich</i> ✓ 2006-2007 Postdoctoral position <i>University of Zurich</i> ✓ 2007-pres Assistant Professor <i>University of Colorado</i> <p>Research Topics</p> <p><i>Graphics recognition for map processing and information extraction</i></p> <ul style="list-style-type: none"> ✓ <i>Historical map processing</i> ✓ <i>Colour image segmentation</i> ✓ <i>Structural and context-based recognition</i> ✓ <i>Composite objects</i> <p><i>Computational GIScience</i></p> <ul style="list-style-type: none"> ✓ <i>Uncertainty in spatial and spatio-temporal information</i> ✓ <i>Fuzzy sets and fuzzy logic for spatial problems</i> 	<p>INTERESTS IN GREC 2011</p> <p>1. Extracting Historical Map Information</p>  <p>2. Color Image Segmentation in Low Quality Maps</p> 
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9th IAPR International Workshop on Graphics Recognition - GREC 2011

IAPR TC10

Integrating Color Image Segmentation and User Labeling for Efficient and Robust Graphics Recognition from Historical Maps

Summary: the integration of a Color Image Segmentation (CIS) step with an interactive road-layer extraction process that consists of an image cleaning and a vectorization step.



Color Image Segmentation

Determining initial color seeds using global color layer prototypes



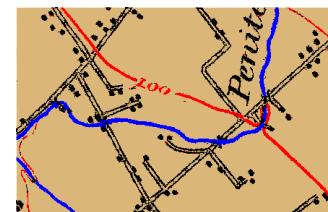
Identifying homogeneous regions (plane) of different color layers



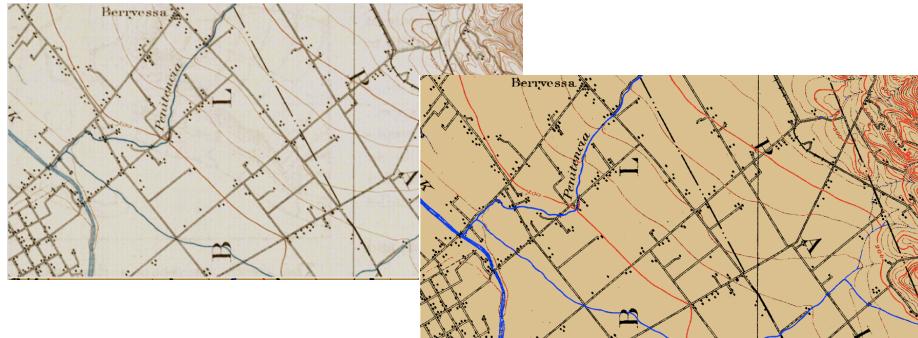
Prototype adjustment: Local color sampling along margins of homogeneous areas



Final segmentation using constrained region growing and connectivity tests

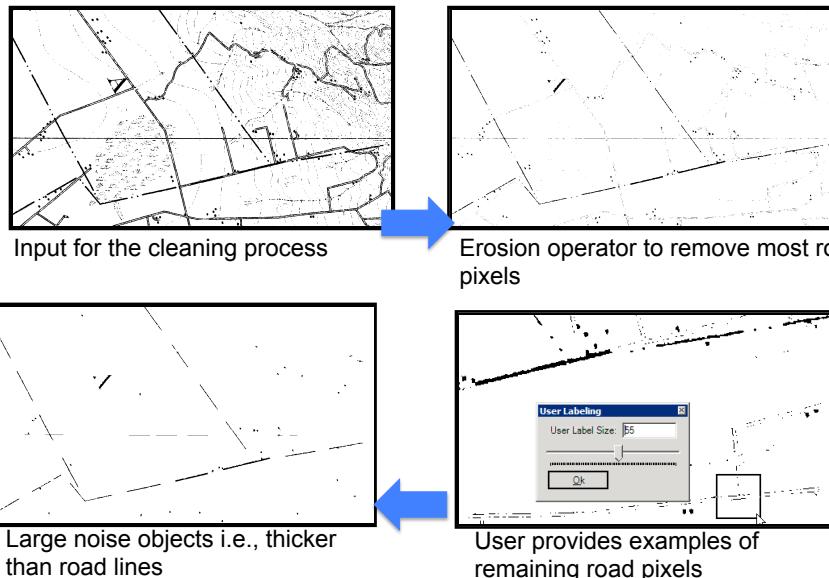


CIS Results in Low-Quality Maps



- Successful and robust separation of color layers
- Only input parameters: map layer color extremes (Red: 255,0,0 in RGB color space)
- Limitations: Remaining merging effects (dense elevation contours and roads), and mixed colors at intersections
- Rigid performance test: “Raw and unrepaired” segmentation as input to cleaning and the road vectorization

Interactive Cleaning



Interactive Cleaning (Cont'd)

