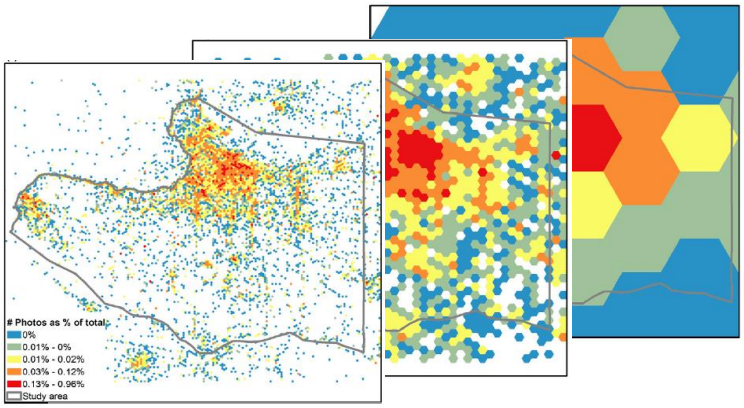
Deutsche Forschungsgemeinschaft

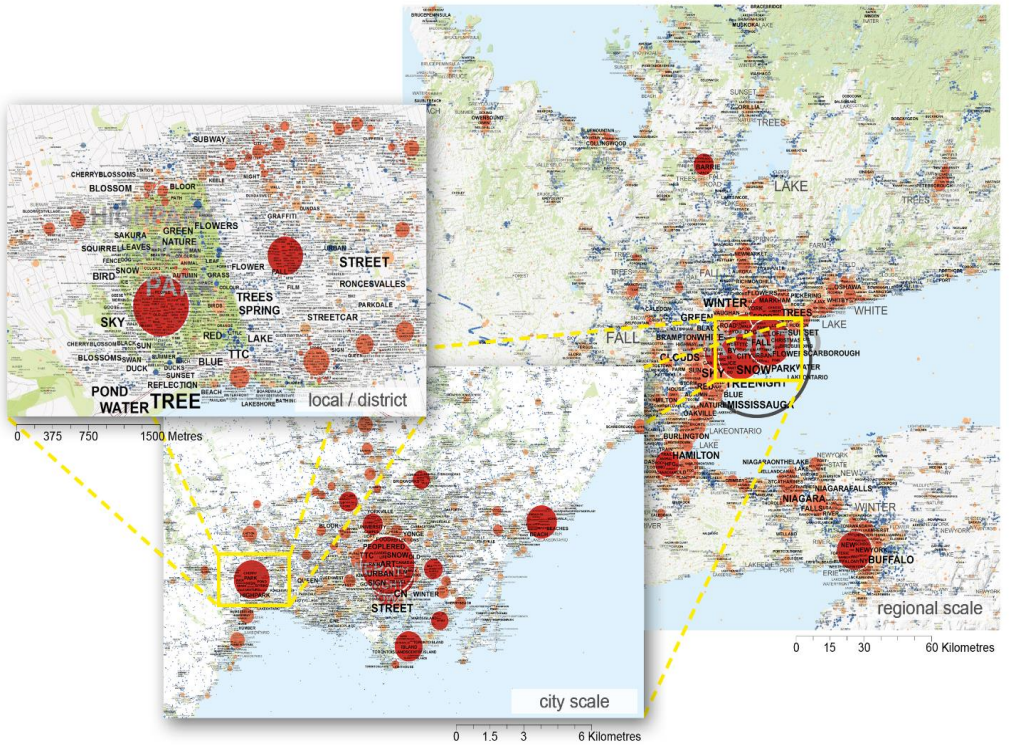
SUMMER SCHOOL VGISCIENCE DRESDEN 2017

Research topic: Generalisation and Multiple Representation of Location-Based Social Media Data

Prof. Dr.-Ing. habil. Dirk Burghardt,
Institute of Cartography, TU Dresden



Multi-scale approach applied to geotagged photographs (Feik and Robertson, 2015)



Multi-scale tag cloud map (Dunkel et al., 2017)

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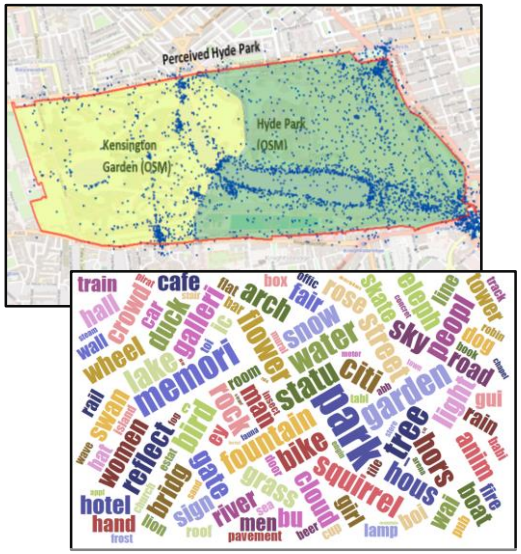
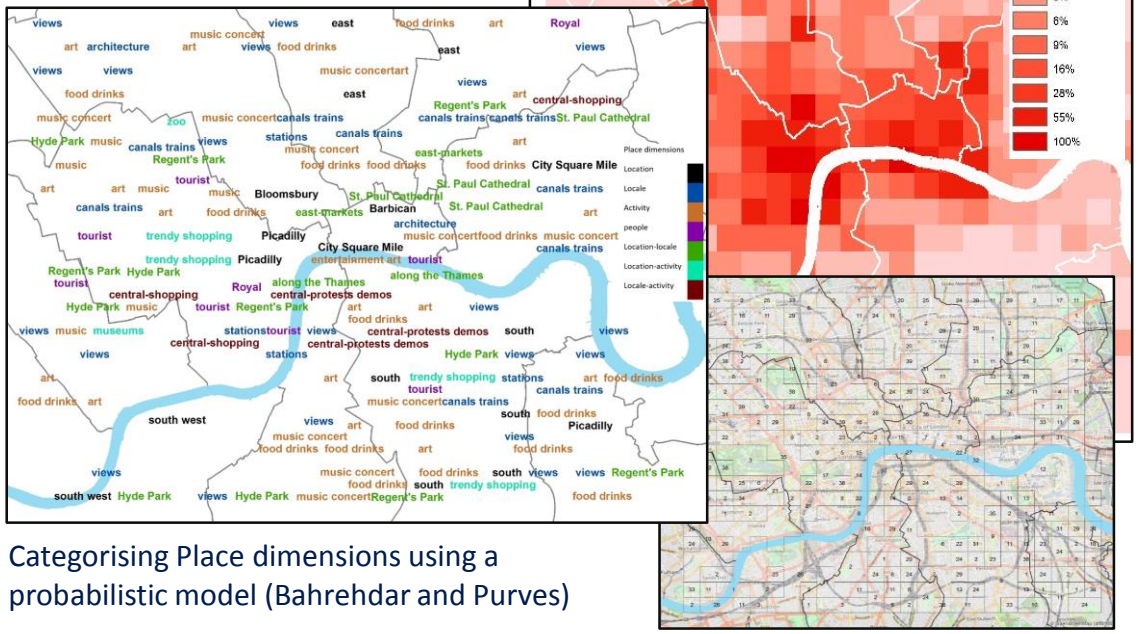
Extracting Place Descriptions from User Generated Content for Map Generalisation

PhD Student. Azam Raha Bahrehdar,
Institute of Geography, UZH Zürich



Linking VGI for map generalisation using representative tags (Bahrehdar and Purves, 2016)



Categorising Place dimensions using a probabilistic model (Bahrehdar and Purves)

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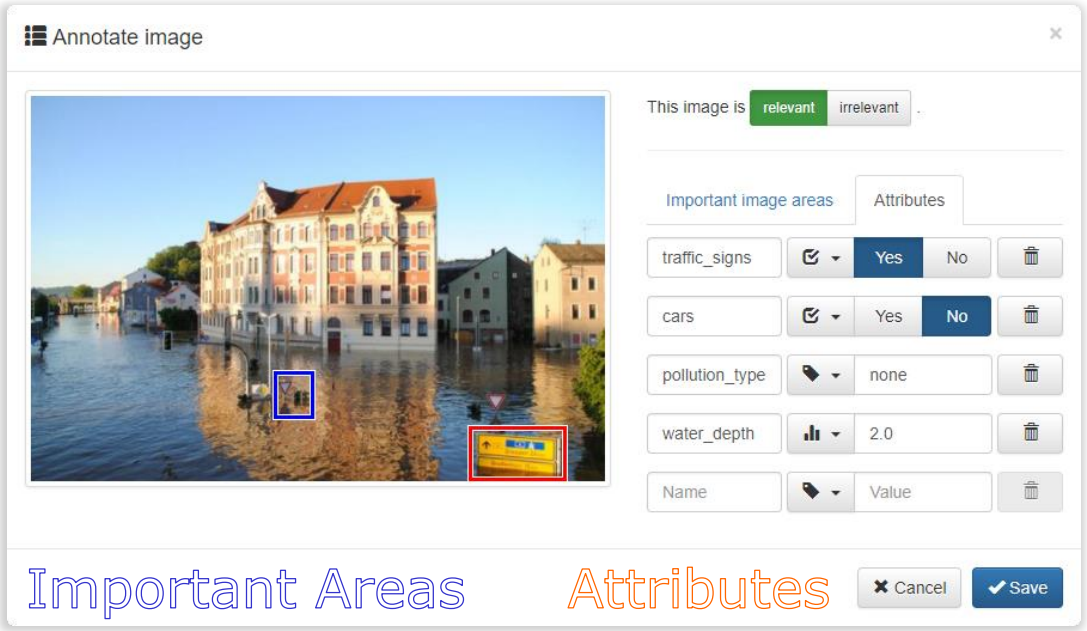
SUMMER SCHOOL VGISCIENCE DRESDEN 2017

Research topic: Interactive Image Retrieval for Enabling Enhancement of Scientific Environmental Data

Björn Barz, Computer Vision Group, FSU Jena

Relevance Feedback

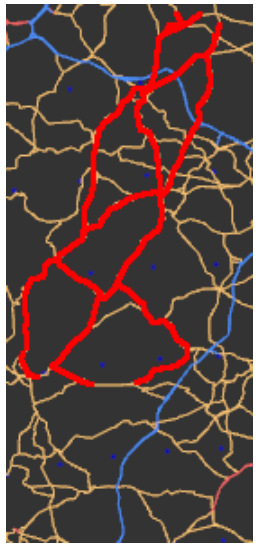


Important Areas Attributes

Project: Lightweight Acquisition and Large-Scale Mining of Trajectory Data

Moritz Beck, Chair of Computer Science I, University of Würzburg

Semantic Tagging of Trajectories

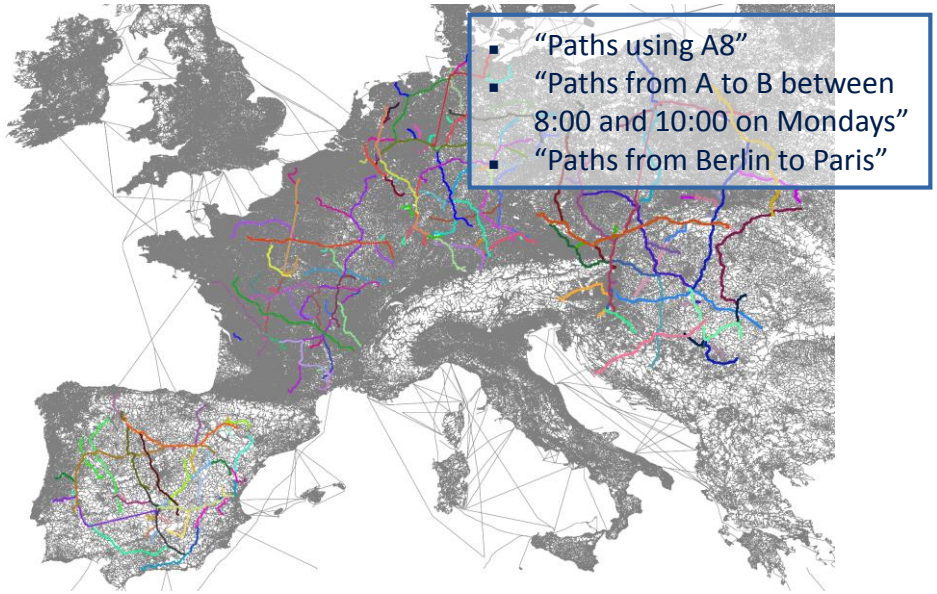


all commuter routes from region A to region B

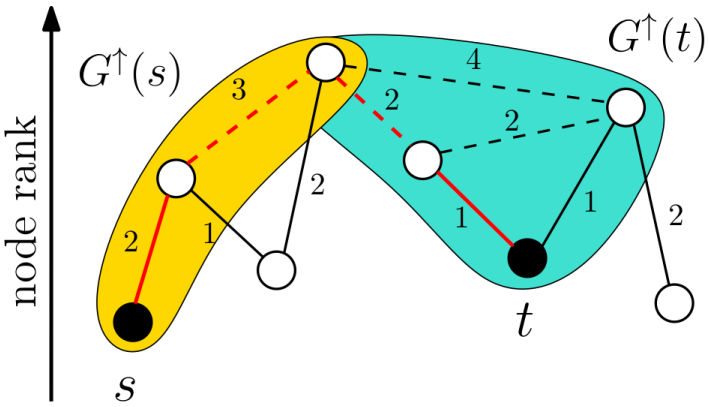
Efficient Pattern Visualization

Research topic: Lightweight Acquisition and Large-Scale Mining of Trajectory Data

Johannes Blum, Chair of Computer Science I, University of Würzburg



Efficiently store, compress and access trajectory data



Exploit data structures for shortest-path computations

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Research topic:
Towards an Opportunistic Location Modelling for Tweet Geo-localization

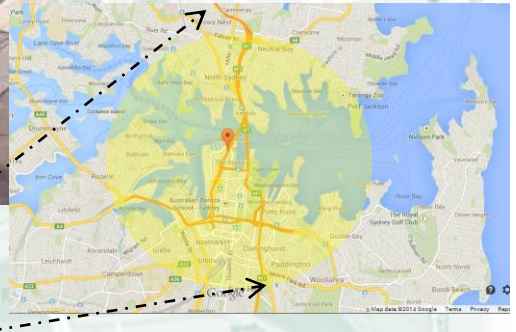
Dr. Rahul Deb Das
Department of Geography,
University of Zurich

Research Objective:

- **How different information can be integrated adaptively to geolocate an ungeotagged tweet at different granularity?**

Information sources: Tweet metadata (user profile, time), location indicative words (toponyms, locale words), context, Instagram images.

Tweet 1: *Afternoon walk in **sydney**????? https://t.co/wu475olJzV, Australia*



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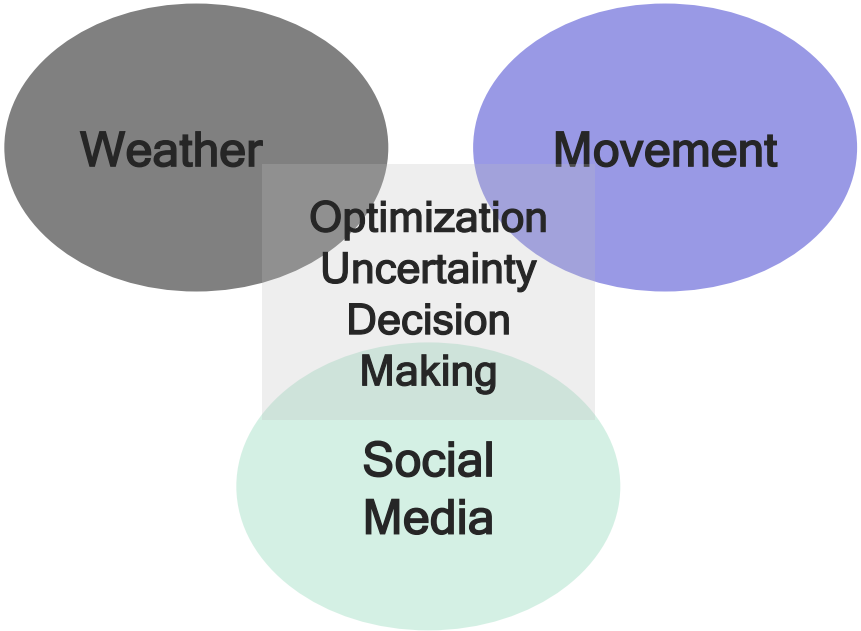
Summer School VGIScience Dresden 2017

Research topic: Uncertainty in Geo-Temporal Data

Dr.-Ing. Alexandra Diehl, University of Konstanz



Projects:

- Echochambers
- Multimodal Trajectories
- Social Weather

Publications

A. Diehl, L. Pelorosso, C. Delrieux, K. Matkovic, J. Ruiz, M. E. Gröller and S. Bruckner. **Albero: A Visual Analytics Approach for Probabilistic Weather Forecasting**. Computer Graphics Forum, to appear, 2017.

M. Hundt, B. Schneider, M. El-Assady, D. A. Keim and A. Diehl. **Visual Analysis of Geolocated Echo Chambers in Social Media**. *EuroVis 2017 - Posters*, The Eurographics Association, DOI: 10.2312/eurp.20171185, 2017.

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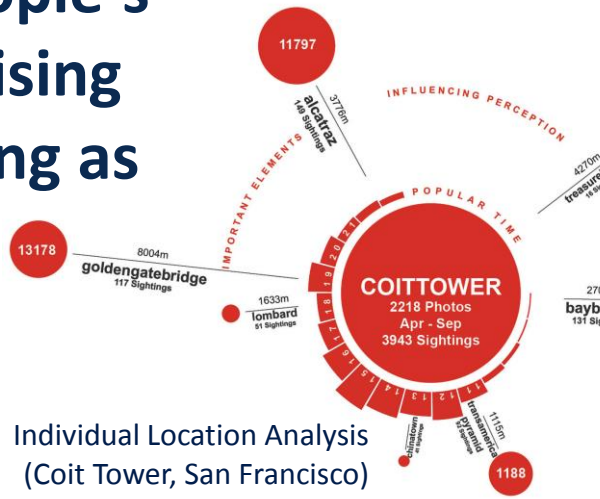
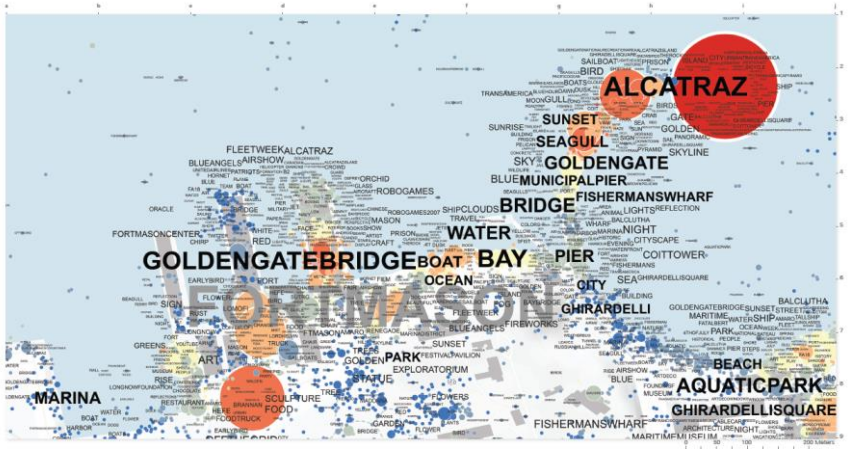
SUMMER SCHOOL VGISCIENCE DRESDEN 2017

Research topic: identifying patterns in people's perception of the environment and visualising collective attribution of values and meaning as a base for multi-resource environmental decision-making processes

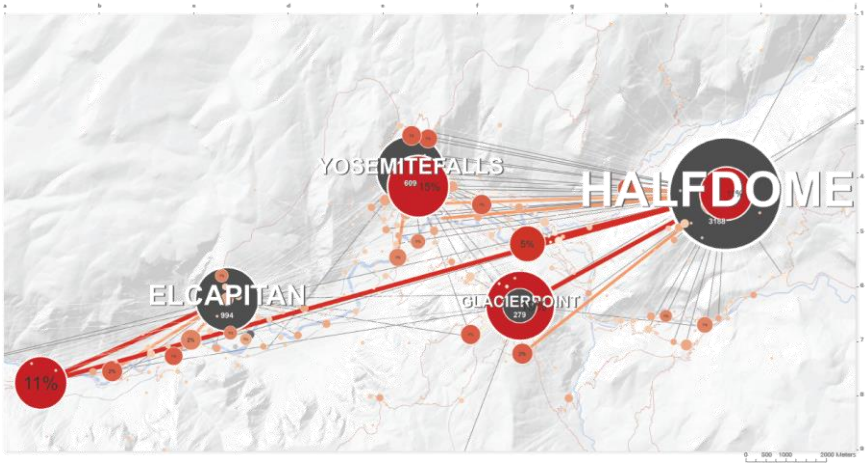
Dr.-Ing. Alexander Dunkel, Institute of Cartography, TU Dresden



Individual Location Analysis (Coit Tower, San Francisco)



Tag Map Fort Mason Center (San Francisco): collective attribution of visual values and meaning from tag clustering (Dunkel, 2012)



Important visual connections and Lines of Sight in Yosemite Valley, extracted from photograph metadata (Dunkel, 2015)

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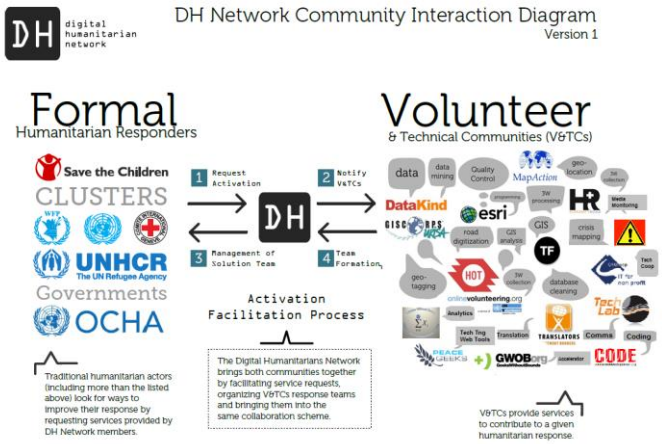
Research topic: Motivation and Participation of Digital Volunteer Communities in Humanitarian Assistance: Models and Incentives for Closing the Gap to Decision Makers

Ramian Fathi (Public Safety and Emergency Management, University of Wuppertal



1. Motivation and incentives of digital volunteers, who provide volunteered geographic information

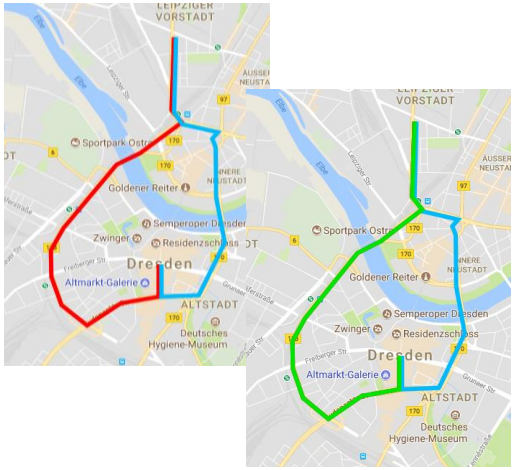
2. The relationship between digital volunteering and conventional volunteering in case of crisis and disaster

3. The quality of the geographic information delivered by digital volunteers and its linkage to decision making

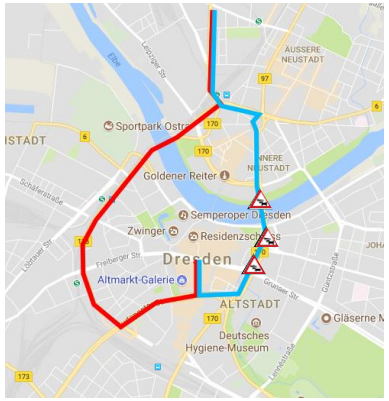
Research topic:
Visual Communication to Control Route Choice Behavior

M.Sc. Lisa Gillmann

Institute of Cartography and Geoinformatics, Leibniz Universität Hannover



Depending on the color, which route would you choose, when this is all the information you have?



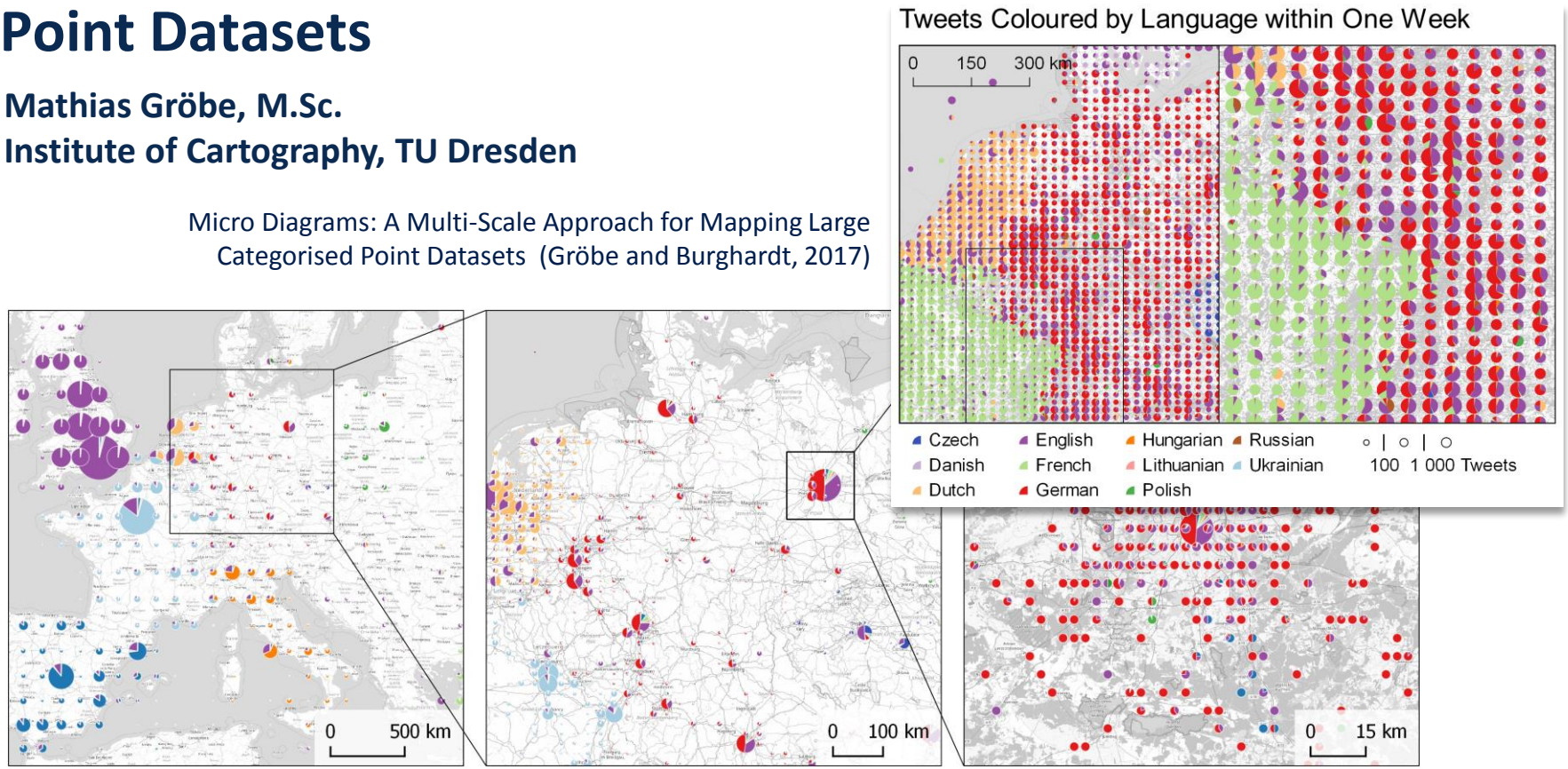
And which one would you choose now?

Source: own illustration, basemap - Google Maps

Research topic: Multiscale Visualisation of Categorised Point Datasets

Mathias Gröbe, M.Sc.
Institute of Cartography, TU Dresden

Micro Diagrams: A Multi-Scale Approach for Mapping Large Categorised Point Datasets (Gröbe and Burghardt, 2017)



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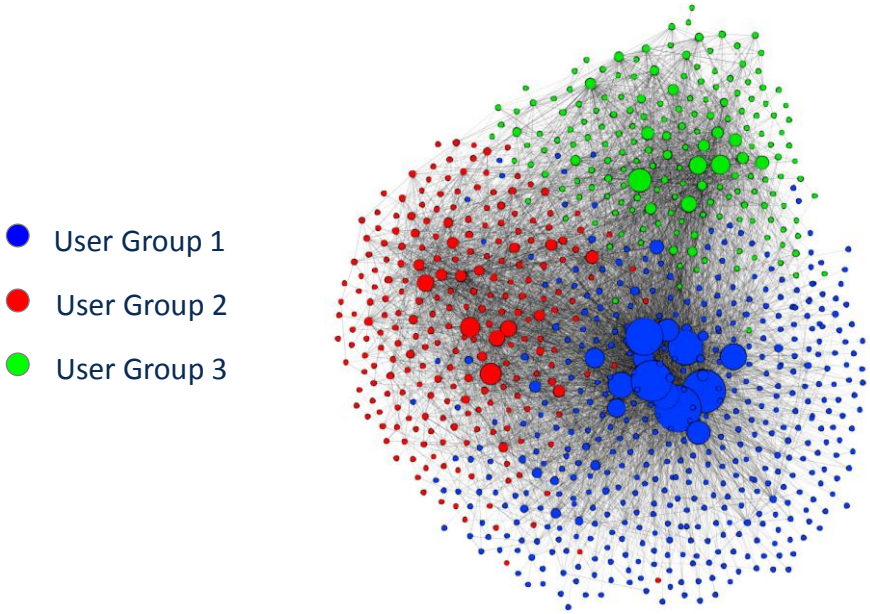
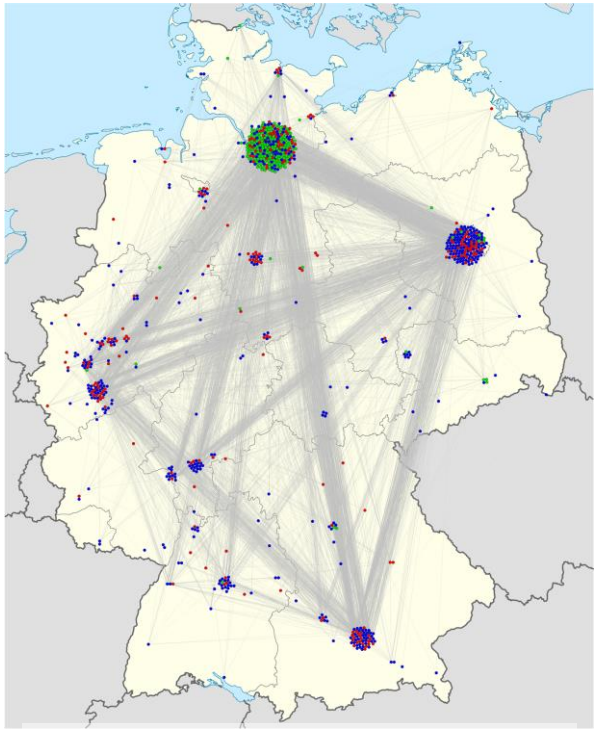
Research topic: Analysis and Visualization of User Groups in Location-Based Social Networks

Thomas Gründemann,
Institute of Cartography, TU Dresden

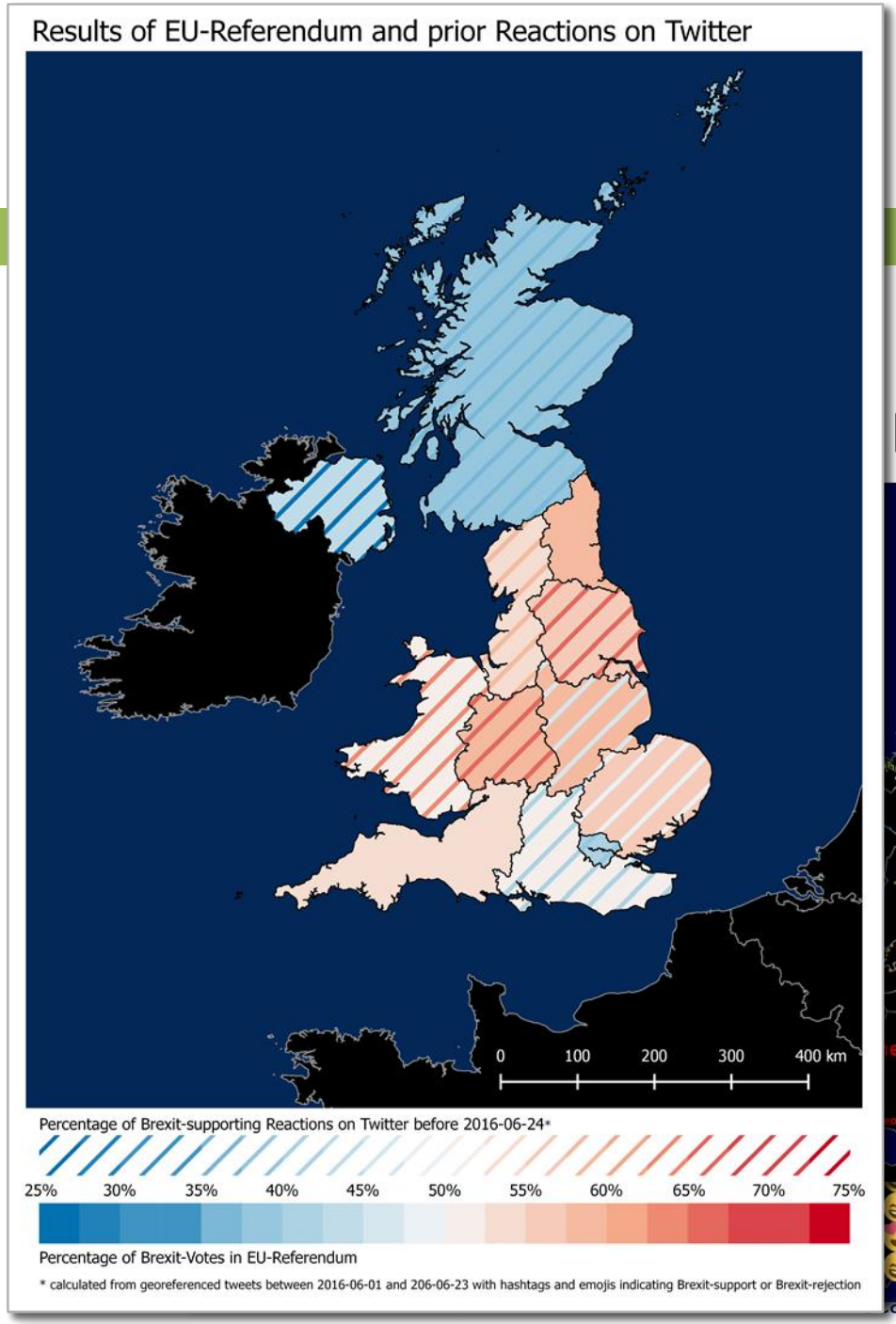


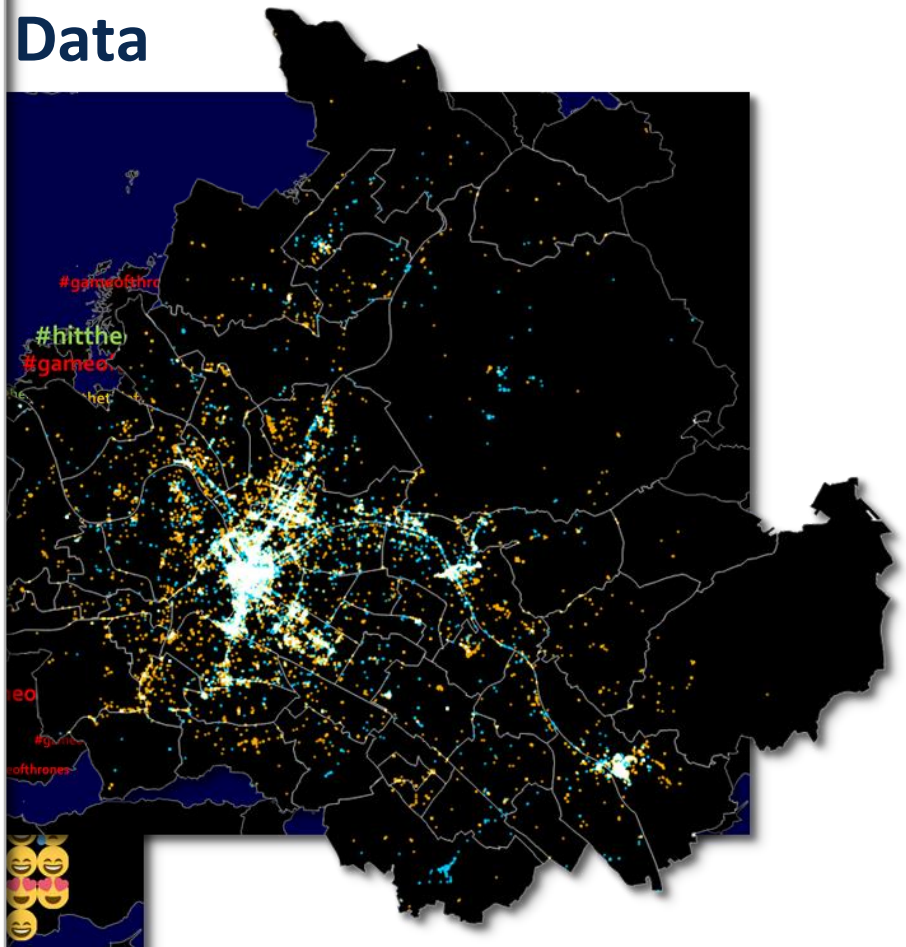
Using Network Analysis for User Group Detection



Spatial Distribution of the User Groups

Emotions and Reactions from Data





ais (Orange) and Tourists (blue) in Dresden (Hauthal & Burghardt, 2016)

Research topic: Crowd-sourced data collection to support automatic classification of building footprint data

Dr.-Ing. Robert Hecht,
Leibniz Institute of Ecological Urban and Regional Development

Building classification and urban structure analysis based on topographic data

Semantic enrichment of building data through VGI (actively or passively crowd-sourced)

Data quality aspects and quality control of crowd-sourced information

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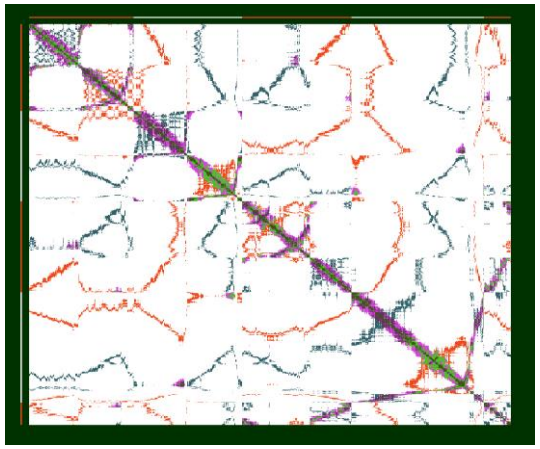
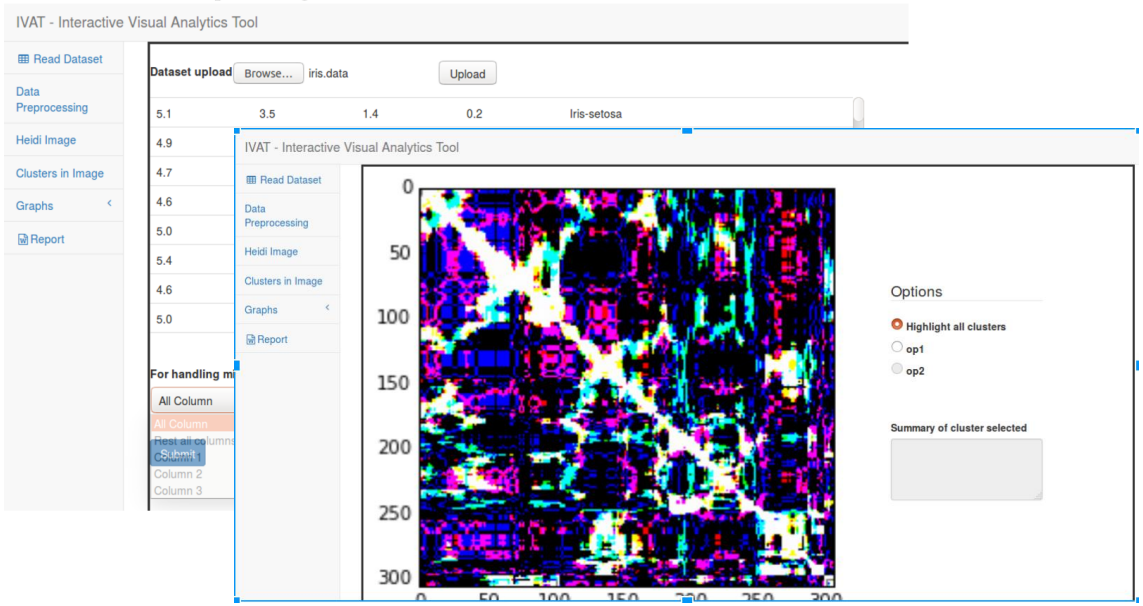
Research topic: Intensive visual analytics tool to visualize and demonstrate high dimensional data

PhD Student. Garima Jindal,
International Institute of Information Technology, Hyderabad
INDIA



Heidi matrix: nearest neighbor driven high dimensional data visualization (2009)

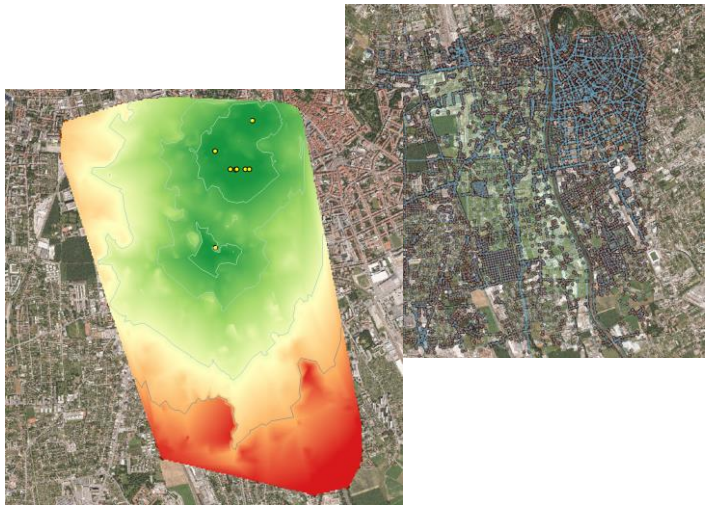


Sample IVAT Screens (2017)

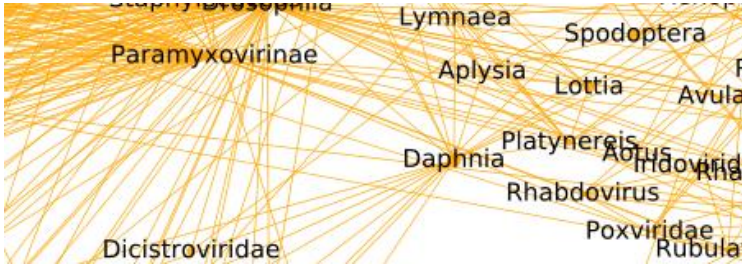
Research topic: open data and network analysis → ?

Stefan Kasberger, Institute for Geography, University Graz

open science + OPEN DATA



Reachability analysis of kebab restaurants (OSM) in Graz.



Text data mining of Zika virus: Co-occurences of species in research publications.

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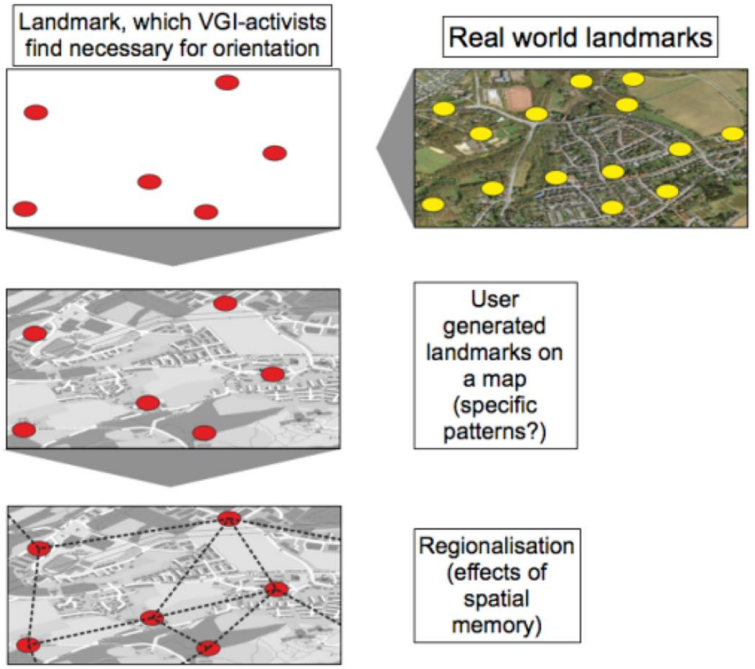
Research topic: Influence of Landmarks in User Generated Maps on Navigation Efficiency and the Generation of Cognitive Maps

Julian Keil, Geomatics Group,
Ruhr University Bochum



Analyzing the Effects of VGI-based Landmarks on Spatial Memory and Navigation Performance (Bestgen et al., 2017)

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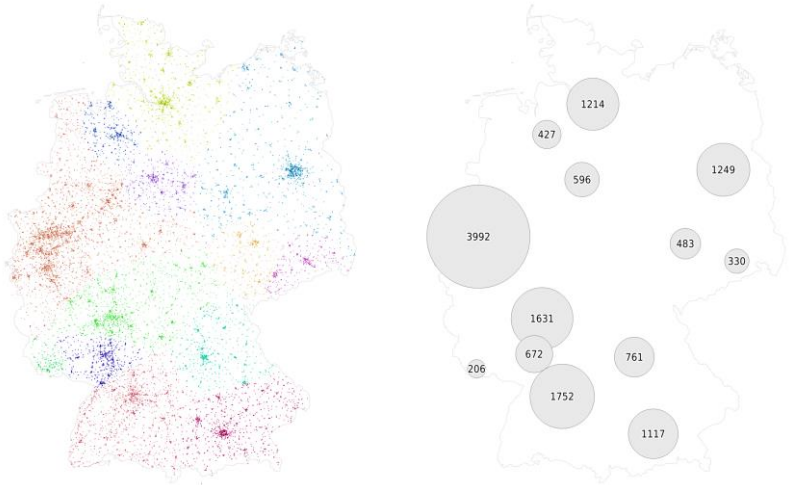
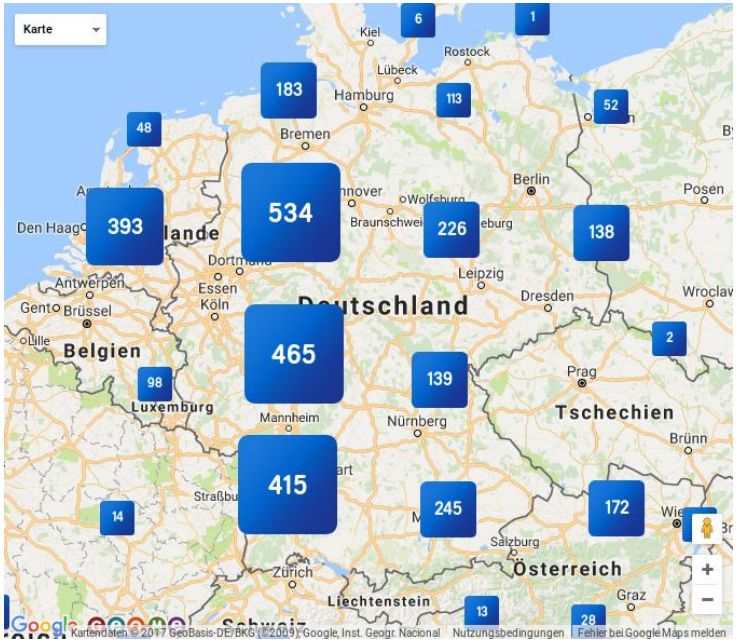
Research topic: Improving cartographic generalisation focusing on point clustering in interactive maps

M.Sc. Johannes Kröger
Lab for Geoinformatics and Geovisualization
HafenCity Universität Hamburg



Preliminary clustering prototype seeded by population distribution (own work)



Grid-based point clustering in the "Tankstellenfinder" of Aral
From http://www.aral.de/de/retail/online-services/tankstellenfinder-und-routenplaner.html

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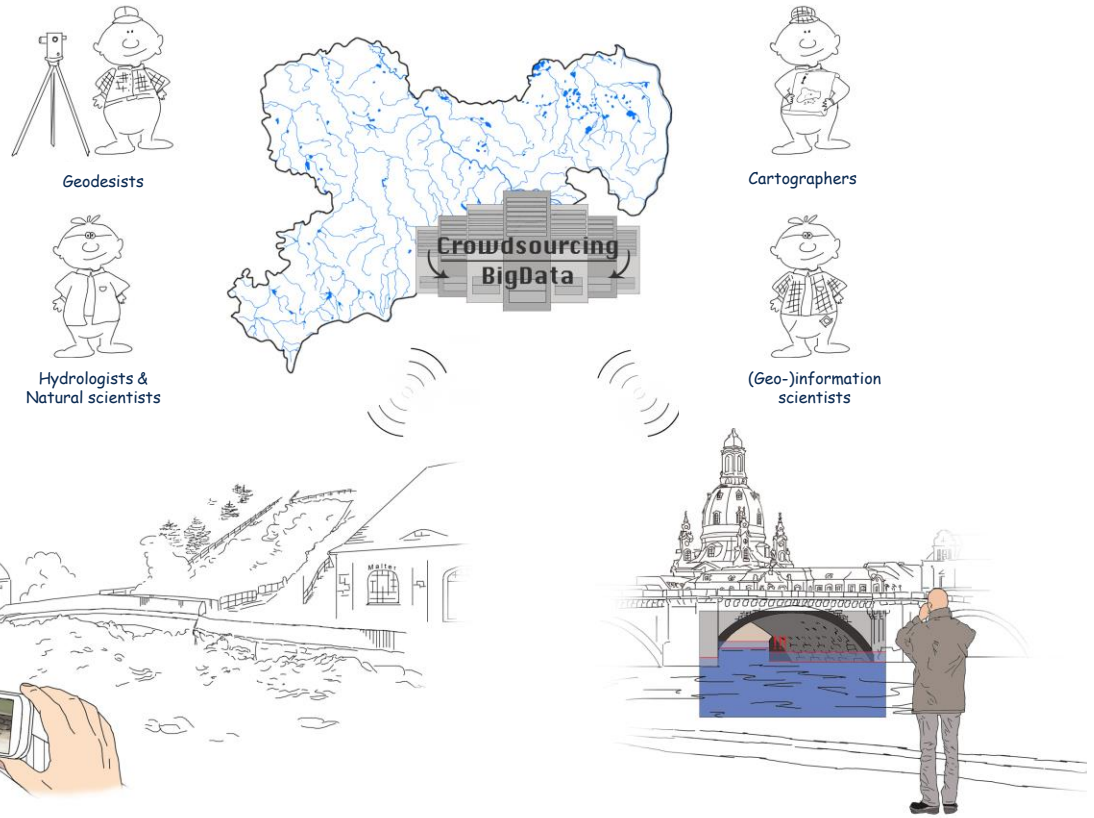
Research topic: Crowdsourcing-based densification of hydrological monitoring systems

Melanie Kröhnert,
Institute of Photogrammetry & Remote Sensing, TU Dresden



Research topic: Application of low-cost sensors for the detection and assessment of hydro-meteorological extreme events

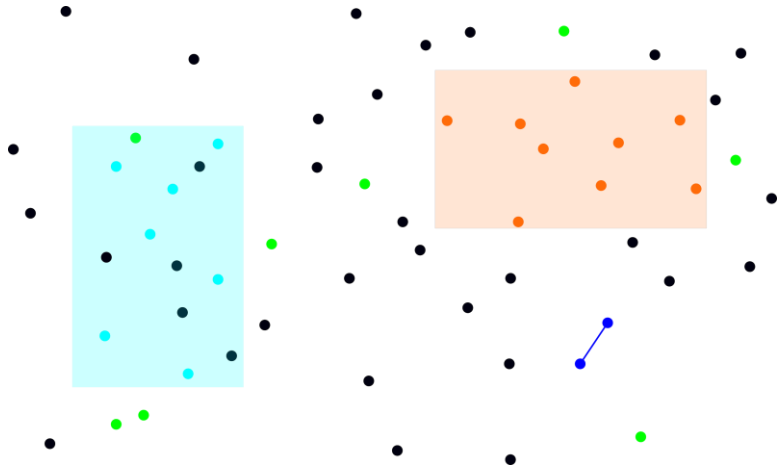
Robert Krüger, Chair of Geoinformatics, TU Dresden

Development of low-cost sensor stations to measure precipitation and soil moisture

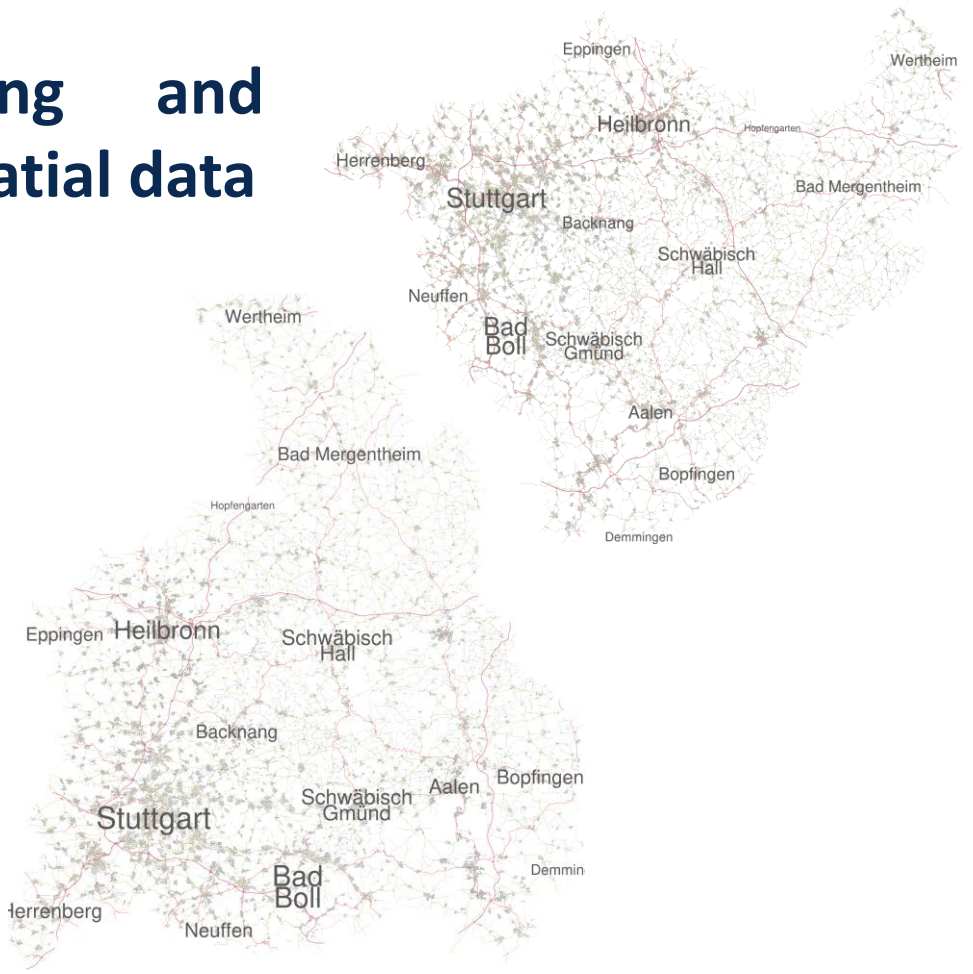
Recruit citizen scientists to densify the observation network

Research topics: Map Labeling and Searching in huge sets of spatial data

Dipl.-Inf. Filip Krumpe
Algorithmic Group, Prof. Dr. Stefan Funke
University of Stuttgart



Searching in huge sets of (prioritized) spatial data



Rotation invariant labeling of interactive maps

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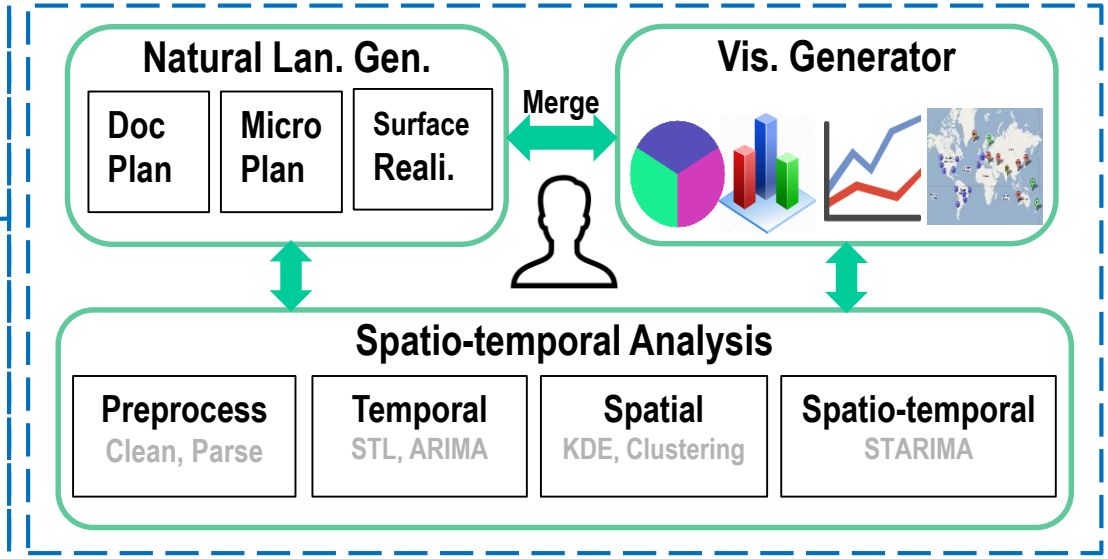
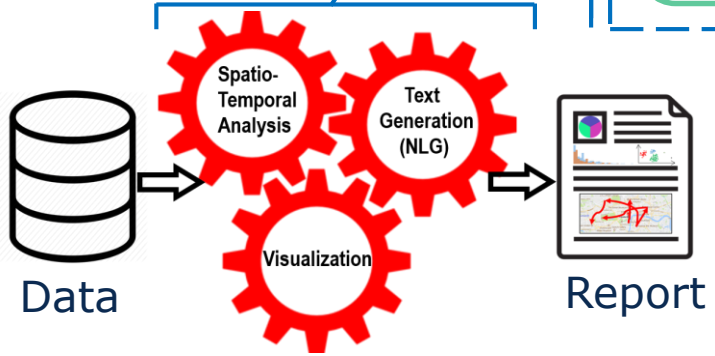
Research Topic: Space–Time Reports: Automatic Generation of Integrated Visualization and Text for Spatiotemporal Data

Shahid Latif
Institute of Computer Science and Business Informatics (ICB), University of Duisburg-Essen





- Automatic
- Interactive
- Integrating text and Vis.
- Dynamic

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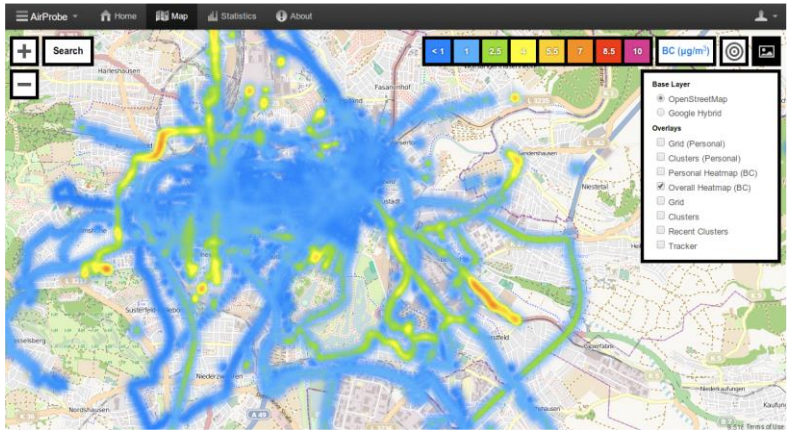
Research topic: From Participatory Sensing to intelligent environmental Maps

Florian Lautenschlager, Institute of Computer Science, Uni Würzburg

Sensorbox for participatory sensing



Intelligent pollution maps

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Research topic: Spatiotemporal Event Detection and Analysis of Social Media Data

Diao Lin, Chair of Cartography, TU Munich

Multi-scale event detection

Real time local and global events detection

Tracing the evolution of events

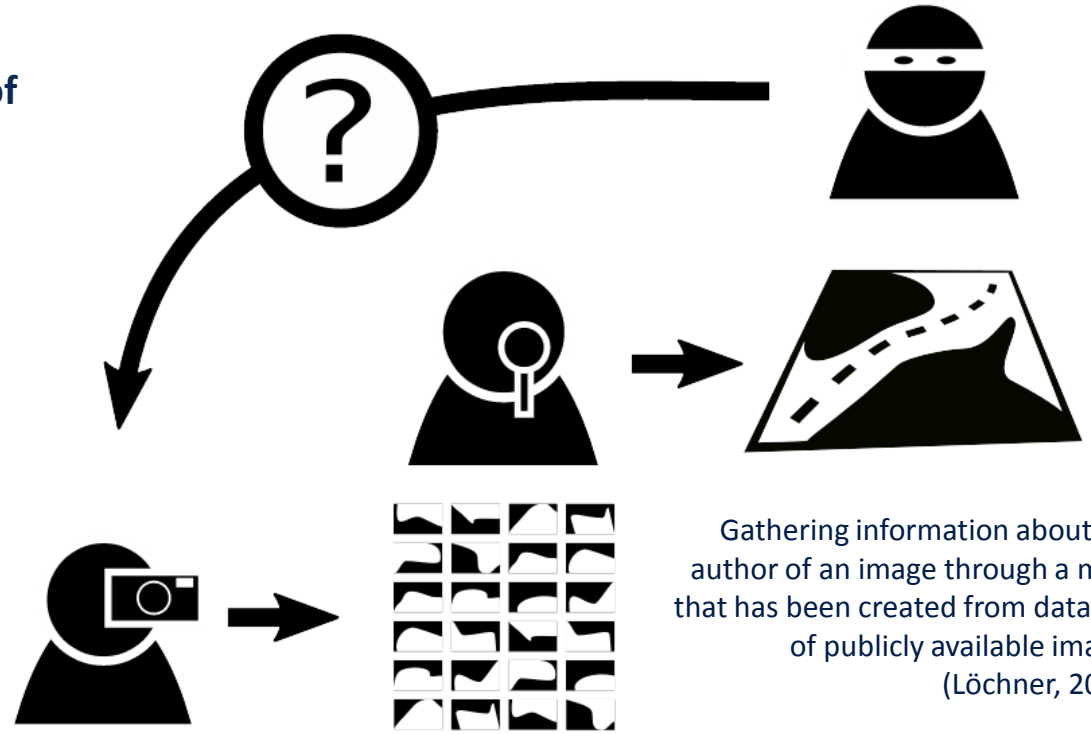
How to trace the spatiotemporal propagation of events automatically?

Exploring applications of events

Utilizing substantial event records to understand the place semantics and individual activities

Research topic: Privacy Aspects in VGI

Marc Löchner M.Sc., Institute of Cartography, TU Dresden



Gathering information about the author of an image through a map, that has been created from data out of publicly available images (Löchner, 2017)

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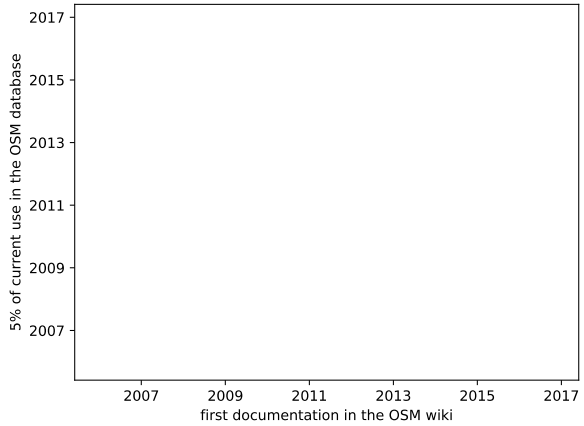
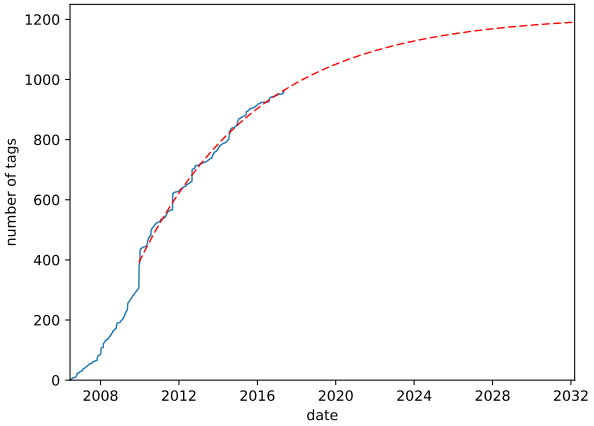
Comprehension of Data Quality and Fitness for Purpose

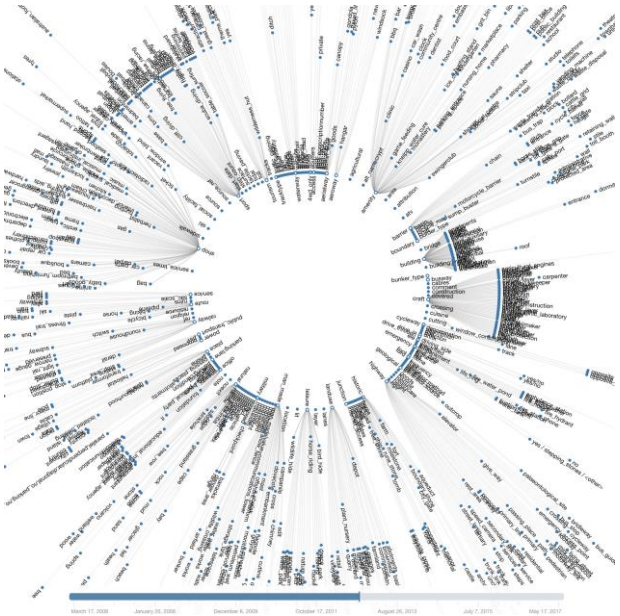
at the Example of Intrinsic Data Quality Measures for VGI

Franz-Benjamin Mocnik
Institute of Geography, Heidelberg University





The OpenStreetMap folksonomy and its evolution
(Mocnik, Zipf, and Raifer 2017)



OSMvis – http://osm-vis.geog.uni-heidelberg.de

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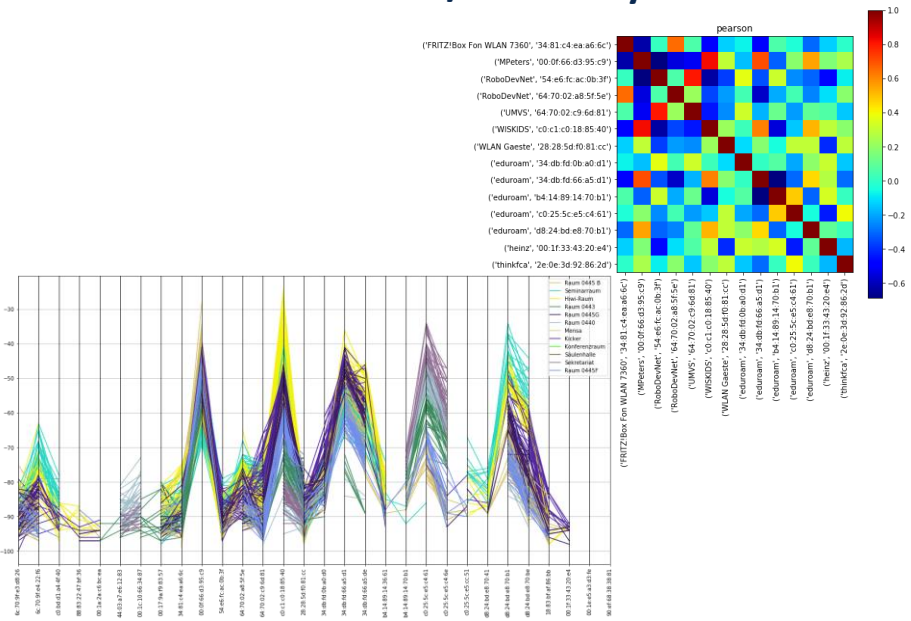
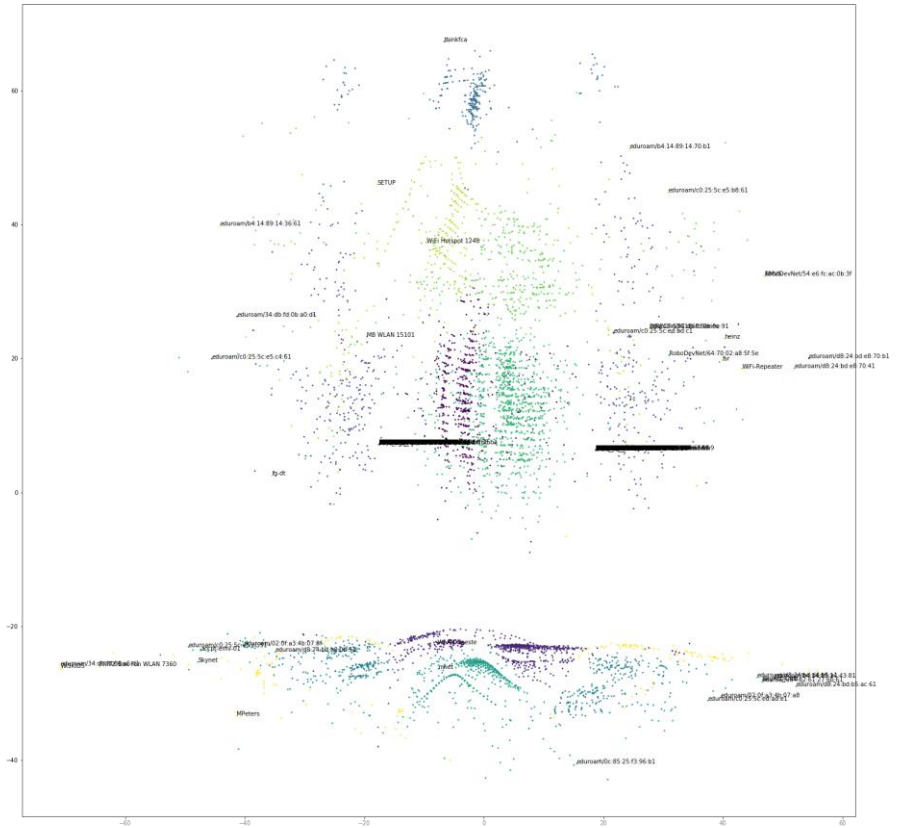
Research topic: Unsupervised Indoor Localization and Mapping using WiFi Signals

Bastian Schäfermeier
L3S Research Center/University of Kassel



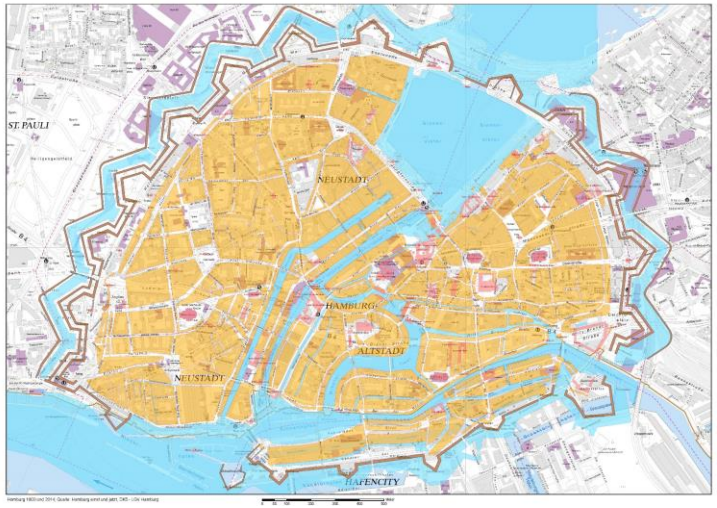
Top-Right: Correlation matrix of WiFi signal strengths
Bottom: Parallel coordinate plot of signal strength vectors



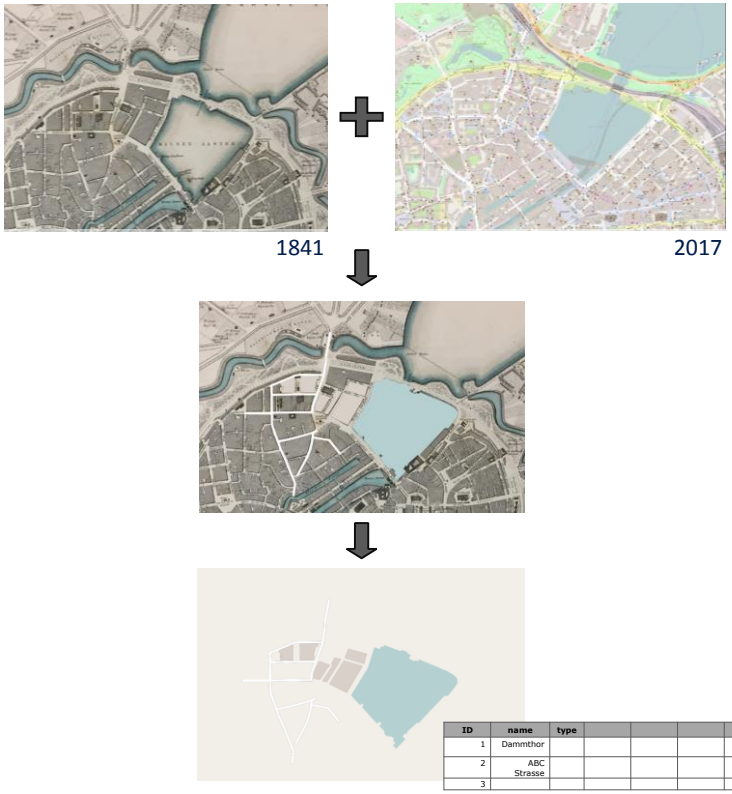
WiFi fingerprint embedding with estimated access point locations

Research topic: Development of a Semiological Methodology on the Comparability of Current with Historical Geodata

Inga Schlegel,
Lab for Geoinformatics und Geovisualization,
HCU Hamburg



Hamburg then and now (Facklam and Fleischhauer, 2014)

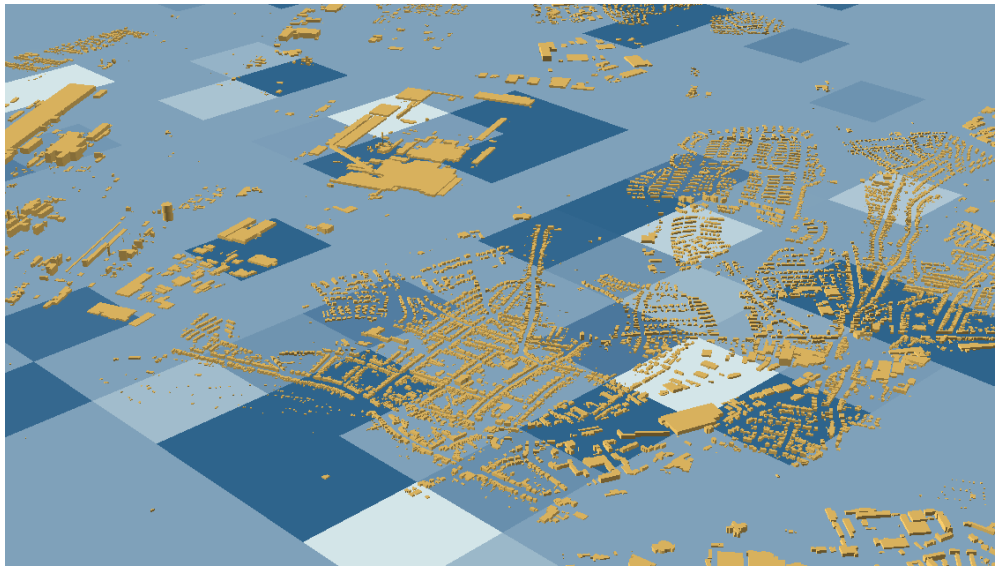


Approach of Transferring Semiology (OpenStreetMap, 2017; Lindley, Davies & Knight, 1841)

Research topic: Estimation of characteristics of residential buildings on the basis of LoD 1 and statistical micro data

Dipl.-Ing. Martin Schorcht,
Leibniz Institute of Ecological Urban and Regional Development (IOER)

3d Buildings – Level of Detail 1 (LoD 1)



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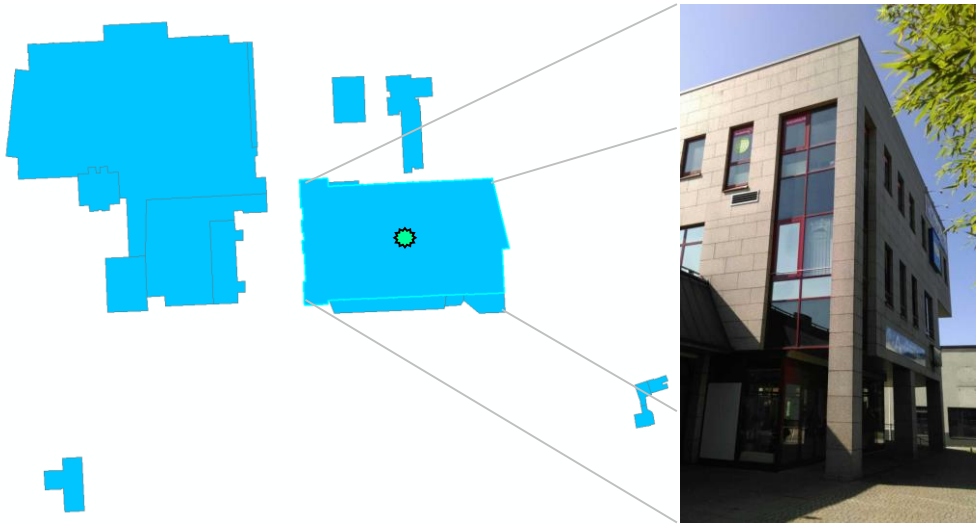
Research topic: Monitoring of Settlement and Open Space Development / German building stock

Steffen Schwarz
Leibniz Institute of Ecological Urban and Regional Development (IÖR)

ALKIS **LoD1**

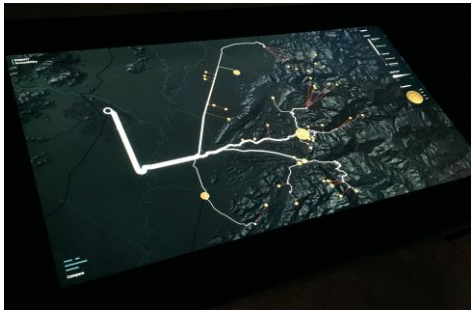
HU-DE **HK-DE**

ATKIS



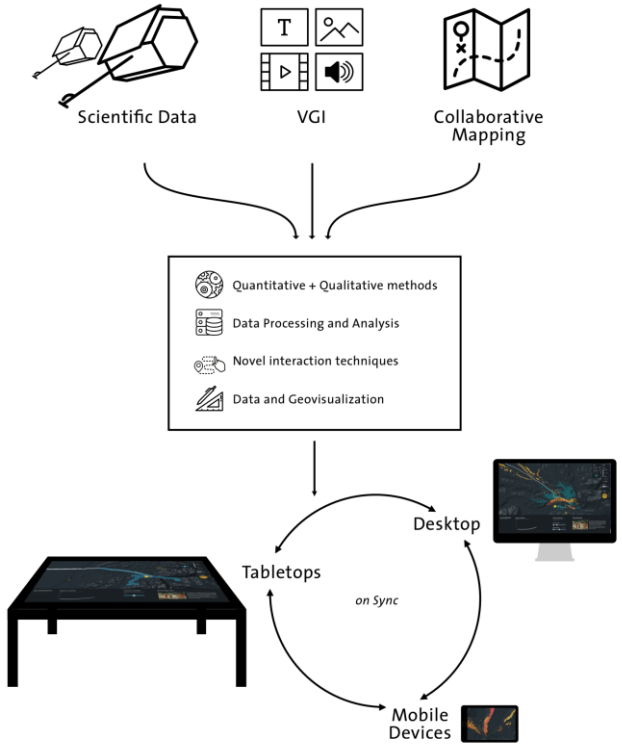
Visualization and HCI approaches for integrating local knowledge as enhancement of quantitative data

Jordi Tost, M.A.
IDL Interaction Design Lab, FH Potsdam



Combination of scientific environmental data and VGI (Tost et al. 2017)

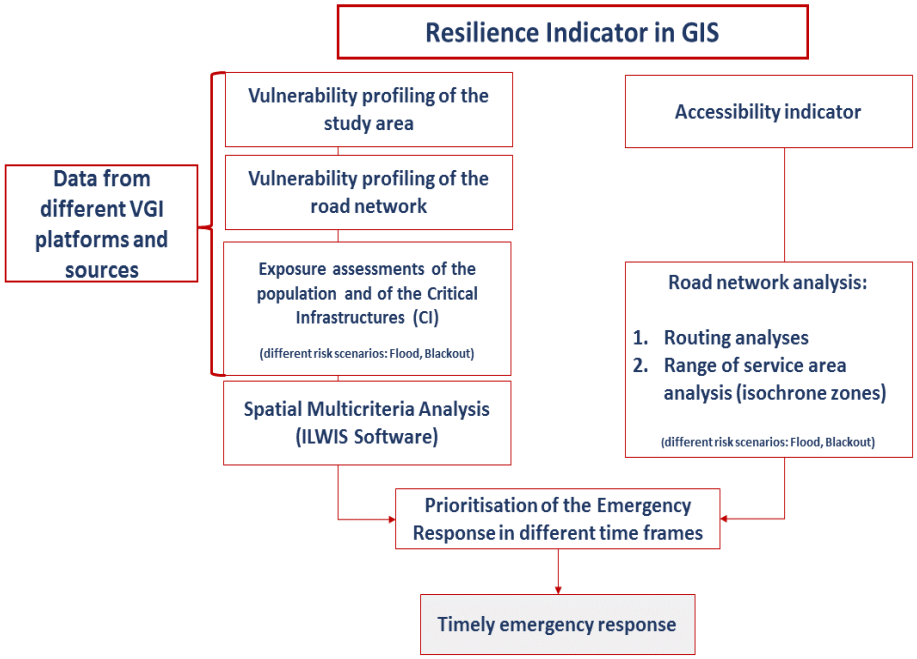
Local knowledge / Citizen Science as enhancement?

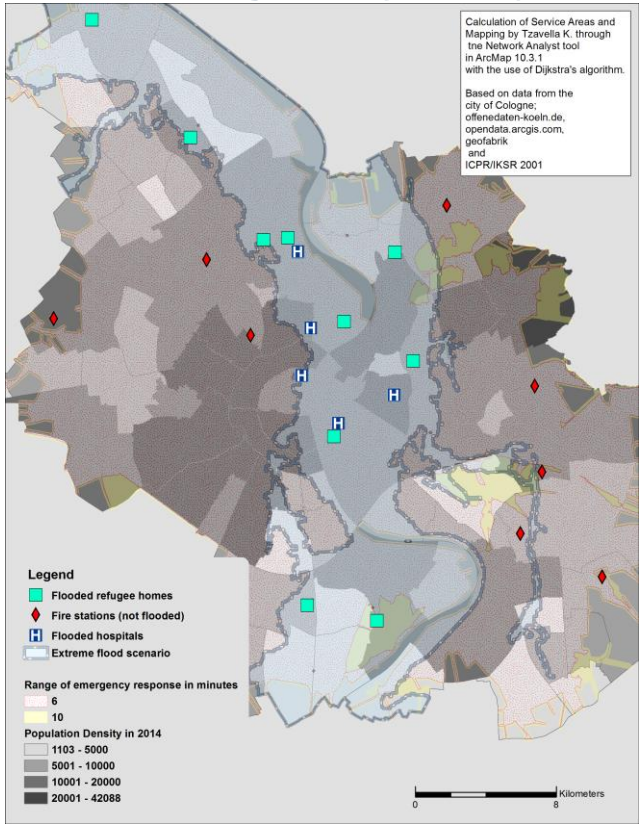


Focus on user-centered visualization methods to support insight formation and decision-making

Research topic: The value and contribution of VGI and GIS to urban resilience through enhancement of emergency response time

Katerina Tzavella
Project Researcher, TH-Cologne University of Applied Sciences
Doctoral candidate, Safety Engineering Program at University of Wuppertal





Service range analysis of the fire brigades of Cologne during an extreme flood scenario combined with population data and exposure assessments for specific CI using data from different VGI platforms

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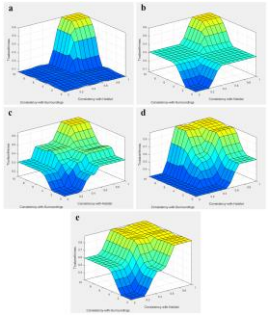
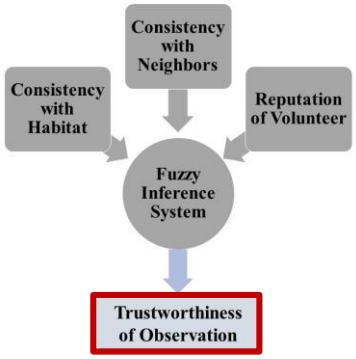
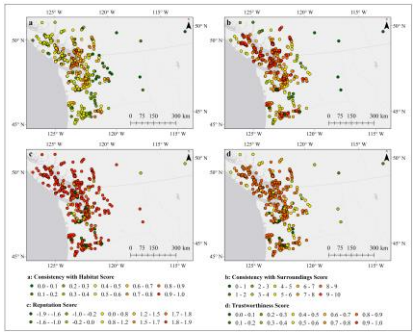
Research topic: Methods for Quality Assurance and Improvement of Volunteered Geographic Information in Tree Inventory Spatial Databases

Hossein Vahidi, Keio University, Japan

iNaturalist.org



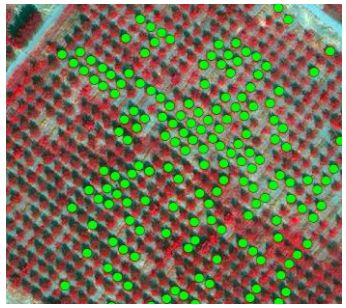




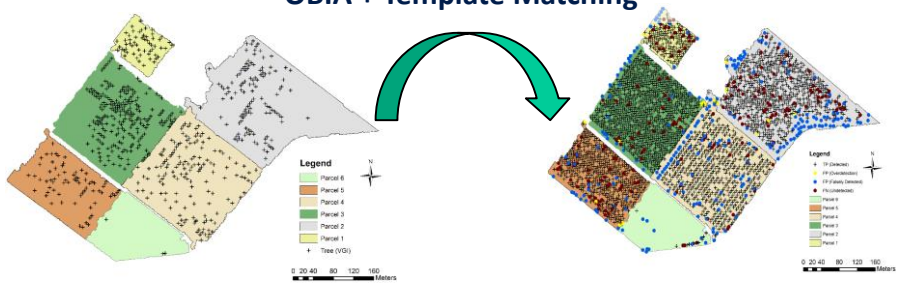
Developing a Proxy Indicator for Intrinsic Quality Assurance of VGI about Tree Species in CS Biodiversity Monitoring Programs

Collective Sensing of Urban Trees

ZARBIN



OBIA + Template Matching



Integration of VGI and VHR Optical Satellite Data for Improvement of the Completeness of VGI in the Tree Inventories for Private Urban Orchards)

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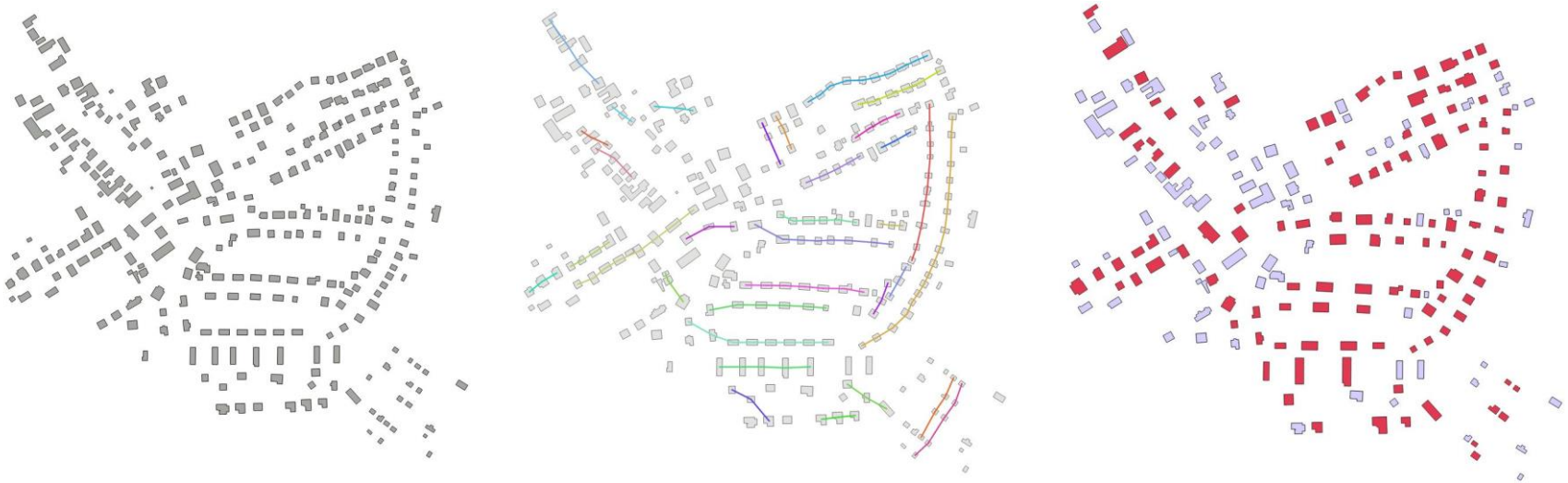
Research topic: Building Pattern Detection and Generalisation

M.Sc. Xiao Wang,
Institute of Cartography, TU Dresden



Building groups detection and generalisation based on stroke

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Research topic:
The Analysis of Spatially Superimposed and Heterogeneous Random Variables --- Using the Example of Social Media

René Westerholt, Institute of Geography, Heidelberg University

How does the spatial superposition of random variables affect spatial analysis results?

How can spatial autocorrelation within AGI datasets be measured and investigated?

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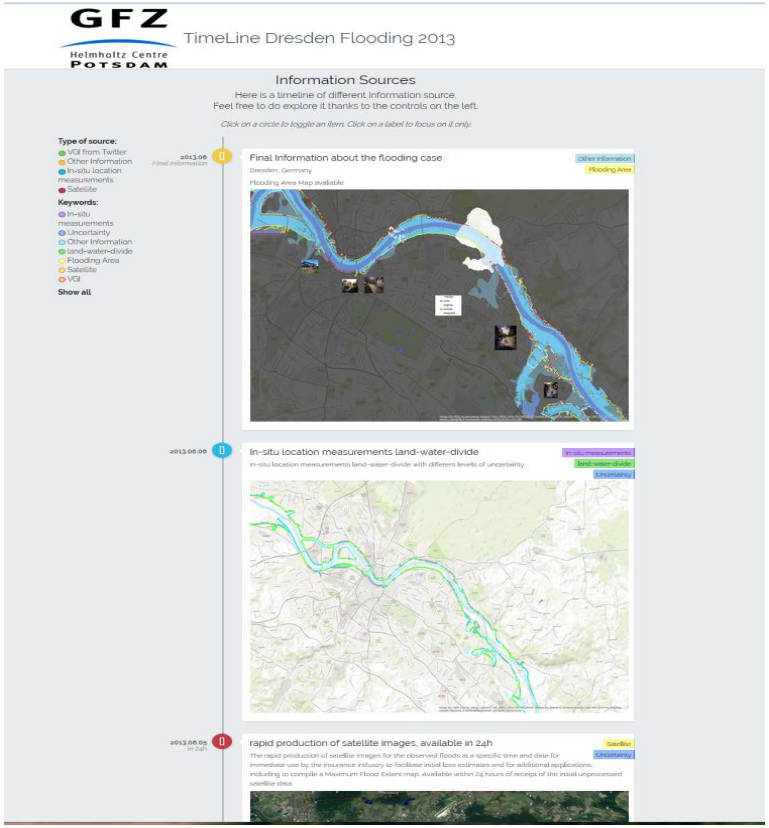
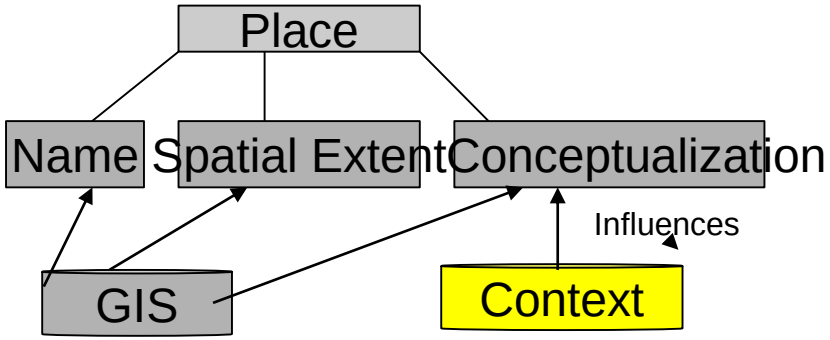
Research topic: Visual Analytics for Enabling Enhancement of Scientific Environmental Data by using volunteered images in social media

Dr. Bin Yang, Section 1.5: Geoinformatics
Helmholtz Centre Potsdam
GFZ



A Framework for Representing and Reasoning with Context-Sensitive Vague Place Descriptions

Madiha Yousaf (Smart Environments, University of Bamberg)



Environment	**environmental features decide applicability of verbs (e.g., "following a river") and may present frames of reference**
Human	**cognitive principle shape conceptualisation and verbalisation process**
Place Description	**hints at how environment is conceptualised, e.g., "direction north-northwest" communicates a finer level of granularity than "north"**

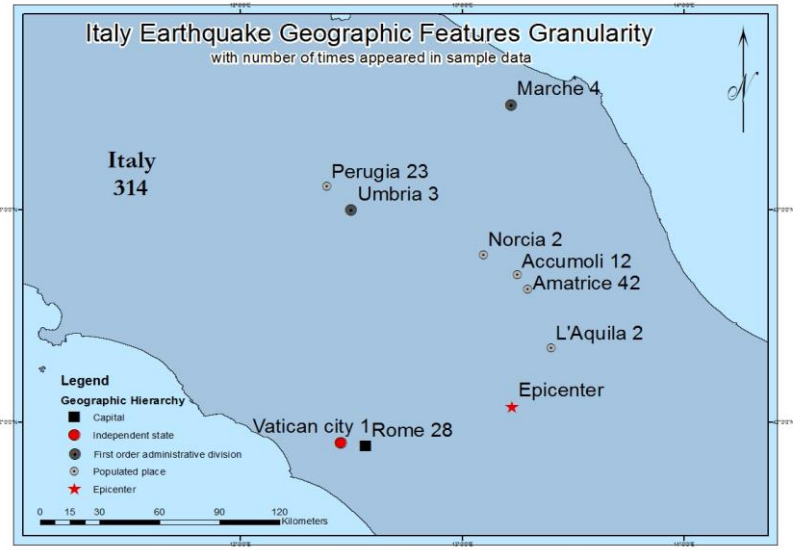
1. aim to build a computational model, a formal knowledge representation and a reasoning algorithm, which allows natural language place descriptions to be interpreted by identifying the described place within a spatial database.

2.To which extent can and should context be incorporated into the model to allow for sensible interpretation of natural language place descriptions?

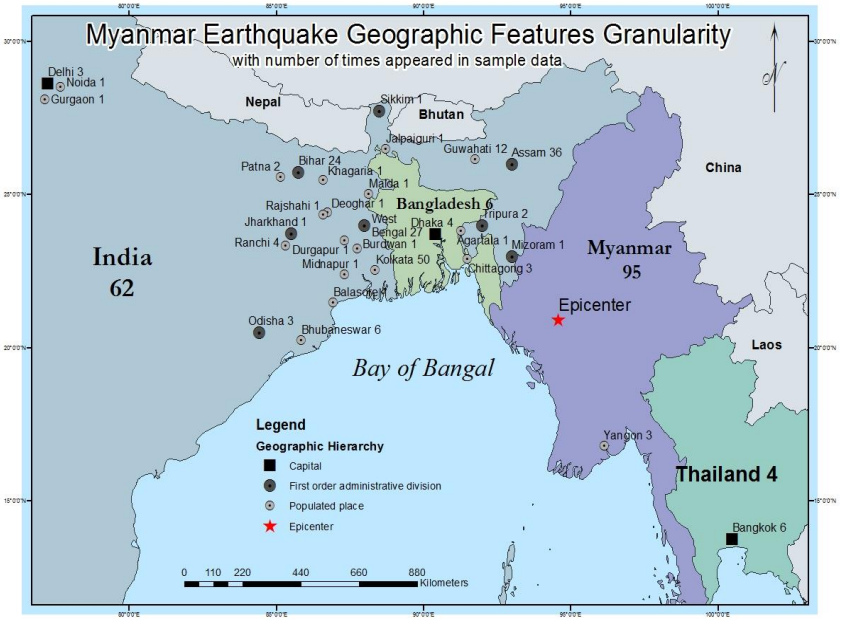
3. How/What will be the query semantics for context sensitive vague place descriptions and relations?How efficiently and effectively can reasoning be performed on the geographic database using the such a model?

Research topic: Natural Disaster Database Design and Development for Himalaya Using Social Media

PhD Student. Kiran Zahra, Institute of Geography, UZH Zürich



Italy earthquake geographic feature granularity according to Geonames (Zahra et al., 2017)



Myanmar earthquake geographic feature granularity according to Geonames (Zahra et al., 2017)