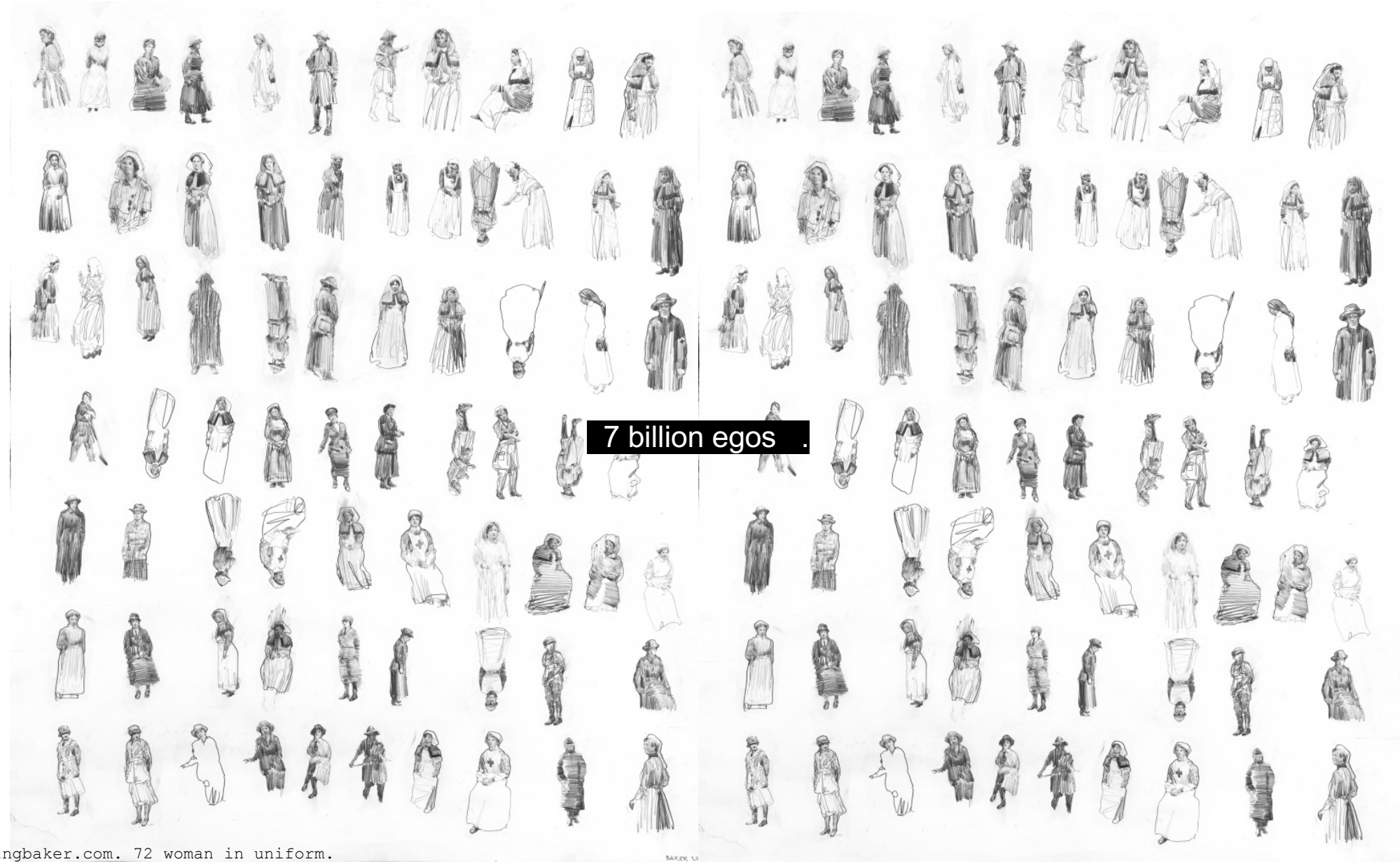
Digital tools for Climate Services

Martin Kohler – HAW Hamburg / HCU Hamburg

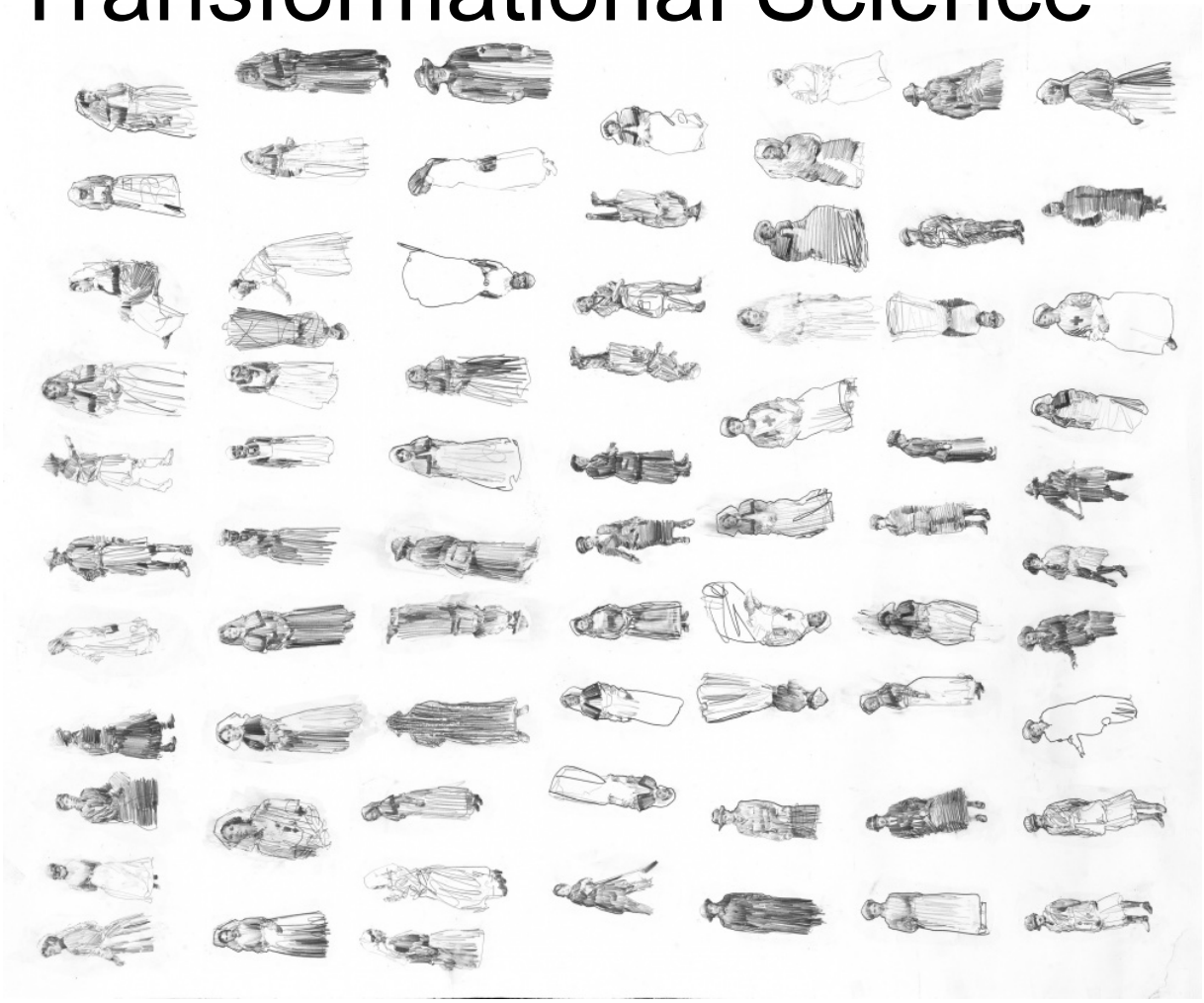
Second Klimapolis Workshop – 20.12.2018

Where is the center of the world?



charmingbaker.com. 72 woman in uniform.

Transformational Science



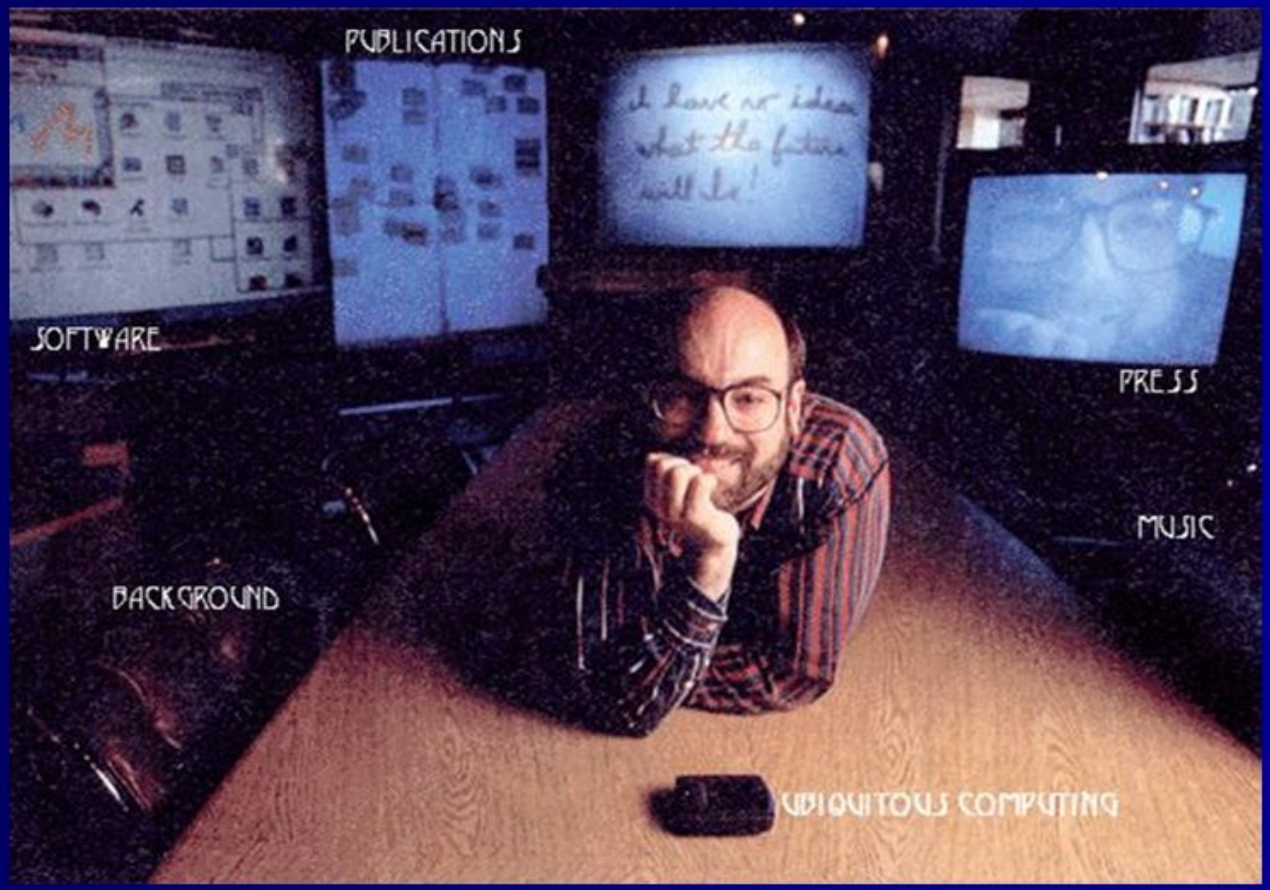
Natural Science

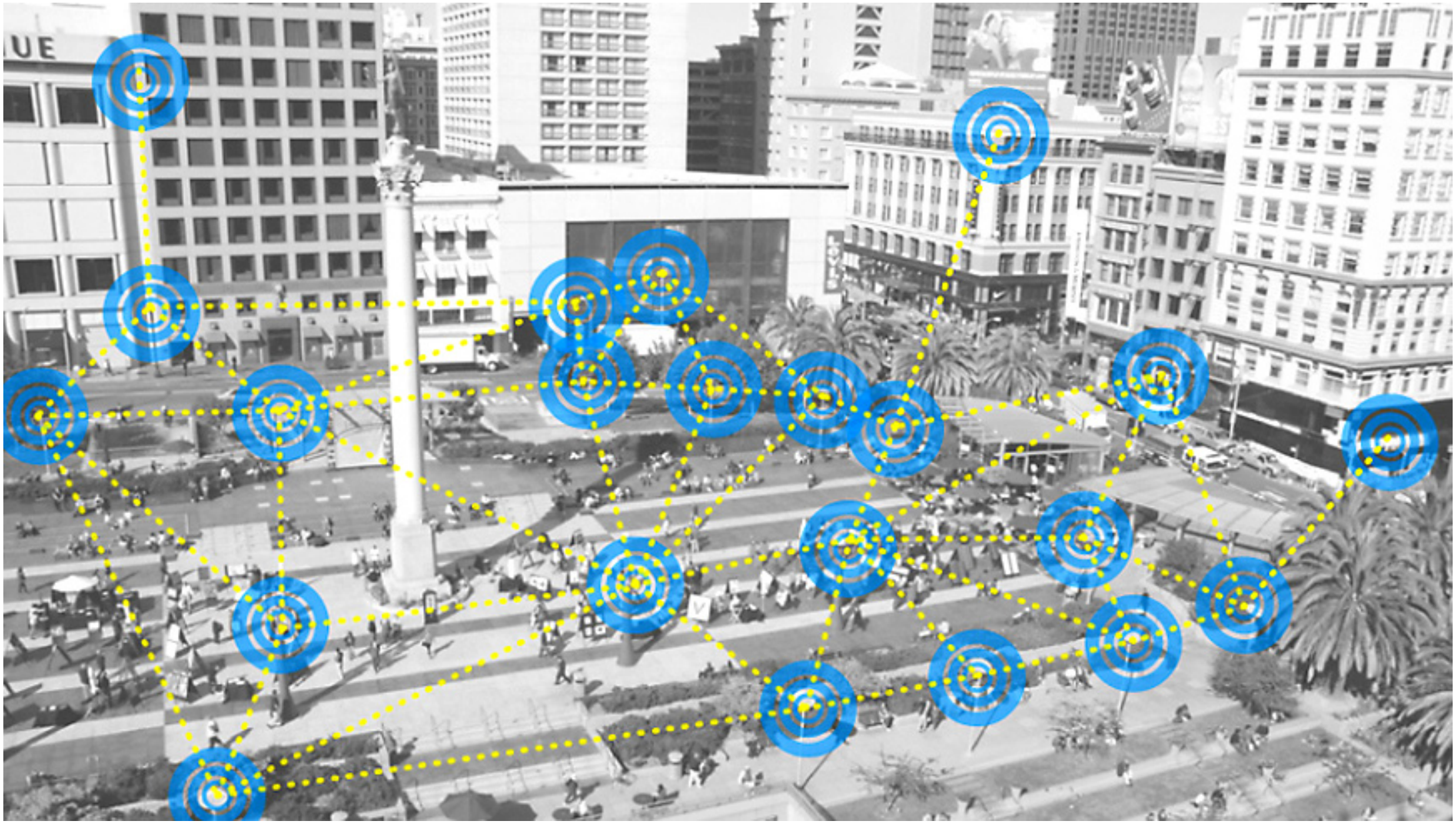
University of Applied Sciences Hamburg
Department of Computer Science
Creative Space for Technical Innovations

HafenCity University Hamburg
Architecture and Urbanism
Urban Photography & UNIBRAL

notes on the the digital

Mark Weiser's Vision





11:32
Mittwoch, 7. Februar
Region Hannover
7°
10° / 2°
Google
Sag "Ok Google"...

luftdaten.info
cityOS Air
CitySense
…

QUELLE: LUFTDATEN.INFO
Hamburg
Bremerhaven
Oldenburg
Groningen
Assen
Alkmaar
Haarlem
Nederland
Den Haag
Arnhem
Osnabrück
Hannover
Wolfsburg
Berlin
Potsdam
Hildesheim
Münster
Bielefeld
Deutschland
Leipzig
Antwerpen
Venlo
Dunkerque
Gent
Calais
Lille
België / Belgique / Belgien
Düsseldorf
Aachen
Bonn
Siegen
Kassel
Koblenz
Chemnitz
Ústí nad Labem
Wałbrzych
Opole
Częstochowa
Radom
Warszawa
Polska
Kalisz
Płock
Włocławek
Grudziądz
Elbląg
Koszalin
Gorzów Wielkopolski
Frankfurt am Main
Mannheim
Würzburg
Nürnberg
Plzeň
Ingolstadt
Augsburg
Karlsruhe
Saarbrücken
Strasbourg
Metz
Reims
Paris
Rouen
Norwich
województwo pomorskie
województwo zachodniopomorskie
województwo kujawsko-pomorskie
województwo warmińsko-mazurskie
województwo lubuskie
województwo wielkopolskie
województwo łódzkie
województwo świętokrzyskie

public science

Volunteered
Geographic
Information (VGI)

citizen science

Air Quality and Open Data: What are the challenges of participatory and volunteered geographic information (VGI) for Data Science, HCI and Artificial Intelligence?

Authors keywords
Participatory Sensing, Big Data, Open Data, Volunteered Geographic Information, Internet of Things, Activism, Citizen Science

Description

Urban systems are deeply penetrated by large sensor networks of many kind. But one of the largest sensor networks is still comparably untouched by urban data and data science: the ubiquity of private mobile and wearable technology holds the possibility of unprecedented monitoring systems beyond the scope of institutionalized platforms.
The challenges of such Volunteered Geographic Information (VGI) are mostly connected with the essential necessity to understand, engage and collaborate with citizens. They are the ones carrying the phone, firing up an app, constructing air quality sensors for their balconies or collecting and gathering data for community maps and archives. People organized in communities and platforms, with different agendas, training and motivation without the direct control of work order.
For Data Experts and analysts this creates the need to collaborate in participatory modes beyond the usual practice of participation. Data from participatory sensing platforms and volunteered geographic information systems pose different challenges for the use of that data. The problem is that non-experts are typically not familiarized with the specific data collection task and thus cannot ensure standardized sensing processes. Furthermore the various communities have own agendas and do not necessarily follow a common approach or might be even avoiding this.

Data Quality: How can environmental data as time and location dependant data from multiple sources be aggregated, contextualized and linked to improve data quality in a heterogenous network of things, that measure something?

Plausibility: How to decide or improve the plausibility of environmental data when
human error, manipulative behaviour, lack of standards, missing calibration, low-quality equipment in varying states of maintenance and technical model is the source of data?

Accessibility: How to deal with ad-hoc networks, autonomous sensing communities, unreliability of technical and social activities, need of trust to access data or varying network protocols and what models of accessibility can be applied to ensure the accessibility of data?

Anomaly Detection: Anomalies are errors or useful new information. How to identify useful anomalies within large heterogenous datasets?

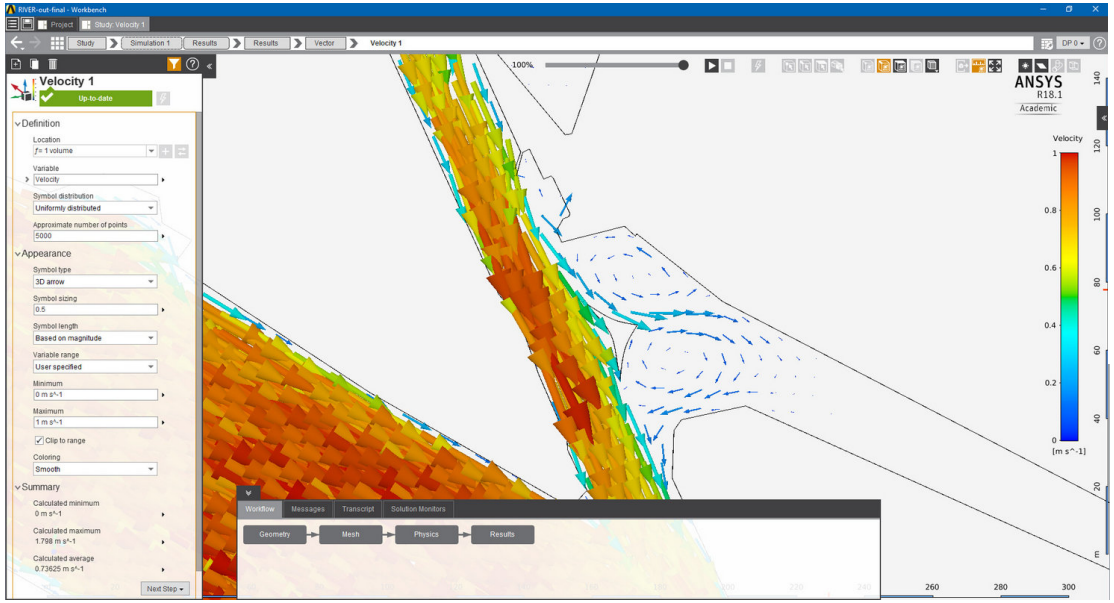
Visualization: How to visualize highly complex datasets for non-IT and non-data experts and activists as explorative tool in highly agile and experimental situations as workshops, makerlabs or private houses?

climate services

some (im)possible projects

Game engines visualizing air pollution data, 2018

Cyborg Landscapes, 2017


RIVER-out-final - Workbench
Project
Study: Velocity 1
Study
Simulation 1
Results
Results
Vector
Velocity 1
Velocity 1
Up-to-date
Definition
Location
Variable
Velocity
Symbol distribution
Uniformly distributed
Approximate number of points
5000
Appearance
Symbol type
3D arrow
Symbol sizing
0.5
Symbol length
Based on magnitude
Variable range
User specified
Minimum
0 m s^-1
Maximum
1 m s^-1
Clip to range
Coloring
Smooth
Summary
Calculated minimum
0 m s^-1
Calculated maximum
1.798 m s^-1
Calculated average
0.73625 m s^-1
Next Step
100%
ANSYS
R18.1
Academic
Velocity
1
0.8
0.6
0.4
0.2
0
[m s^-1]
Workflow
Messages
Transcript
Solution Monitors
Geometry
Mesh
Physics
Results
140
120
100
80
60
40
20
m
260
280
300

How will we breathe tomorrow?, 2016
Jessica Broscheit

The intelligent mirror, 2015

Thx

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