The State-of-the-Art in
Map-like Visualization

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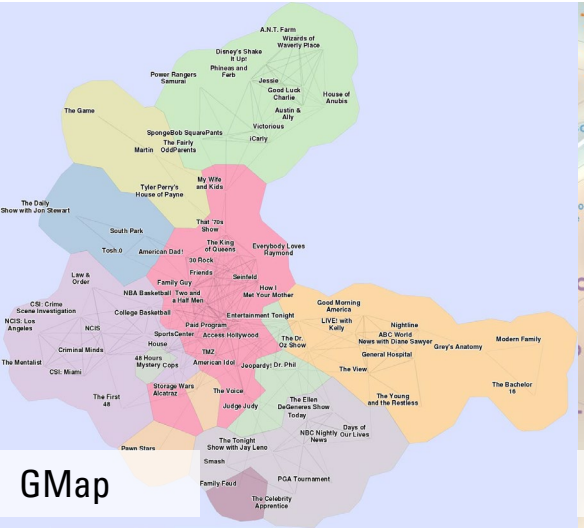
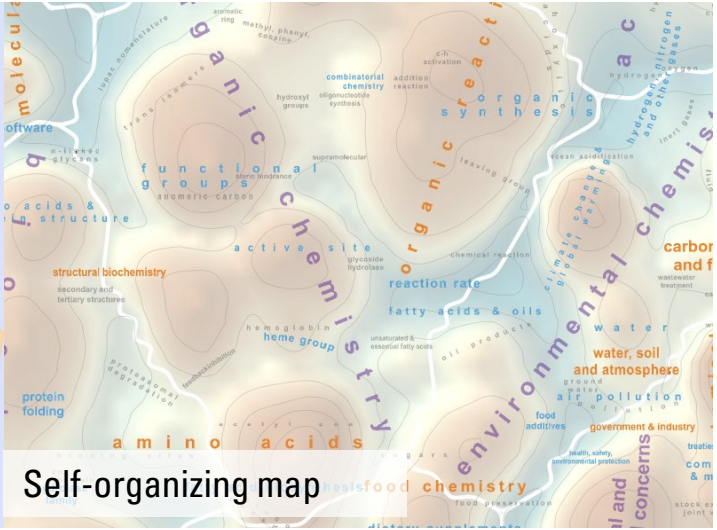
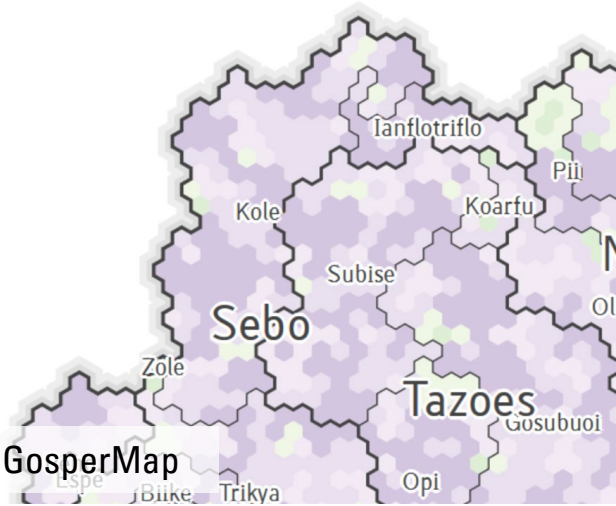
What is map-like visualization?



GMap



Self-organizing map

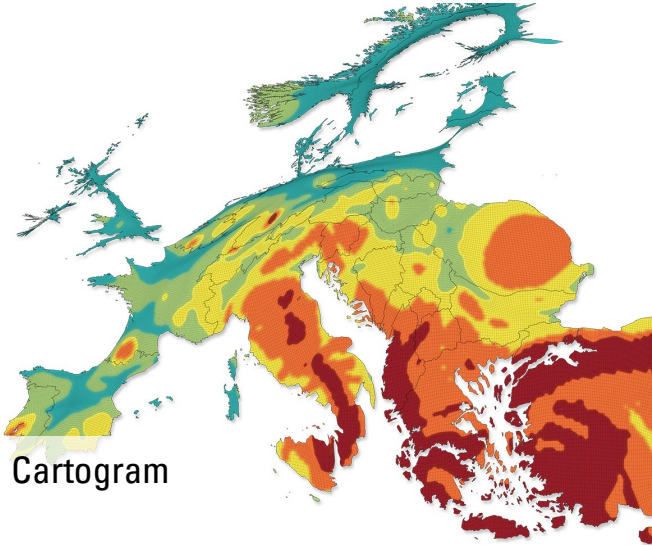


GosperMap

What are maps?

Satellite image

Metro Map



Cartogram

Contributions

- **Definition** of the term map-like visualization
- **Classification** of map-like visualization techniques
- **Literature Overview** of existing map-like techniques

Defining
Map-like Visualization

What is …

Abstract Visualization

Map-like Visualization

Cartographic Map

Perspectives

Abstract Visualization

Imitation

Map-like Visualization

Schematization

Cartographic Map

Definition

A visualization is map-like, if it either imitates or schematizes a cartographic map

Classifying
Map-like Visualization

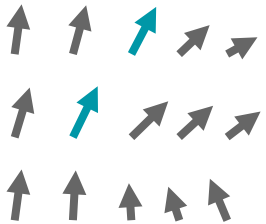
Map Elements

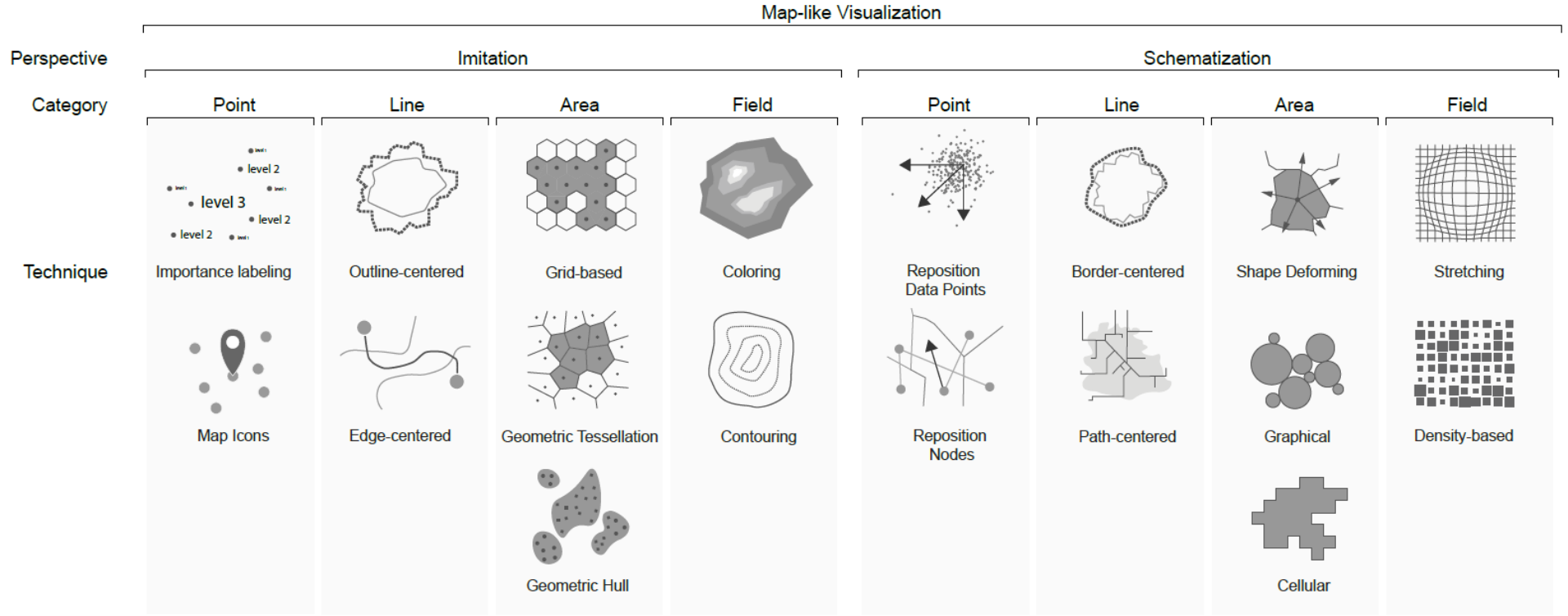
Point

Area

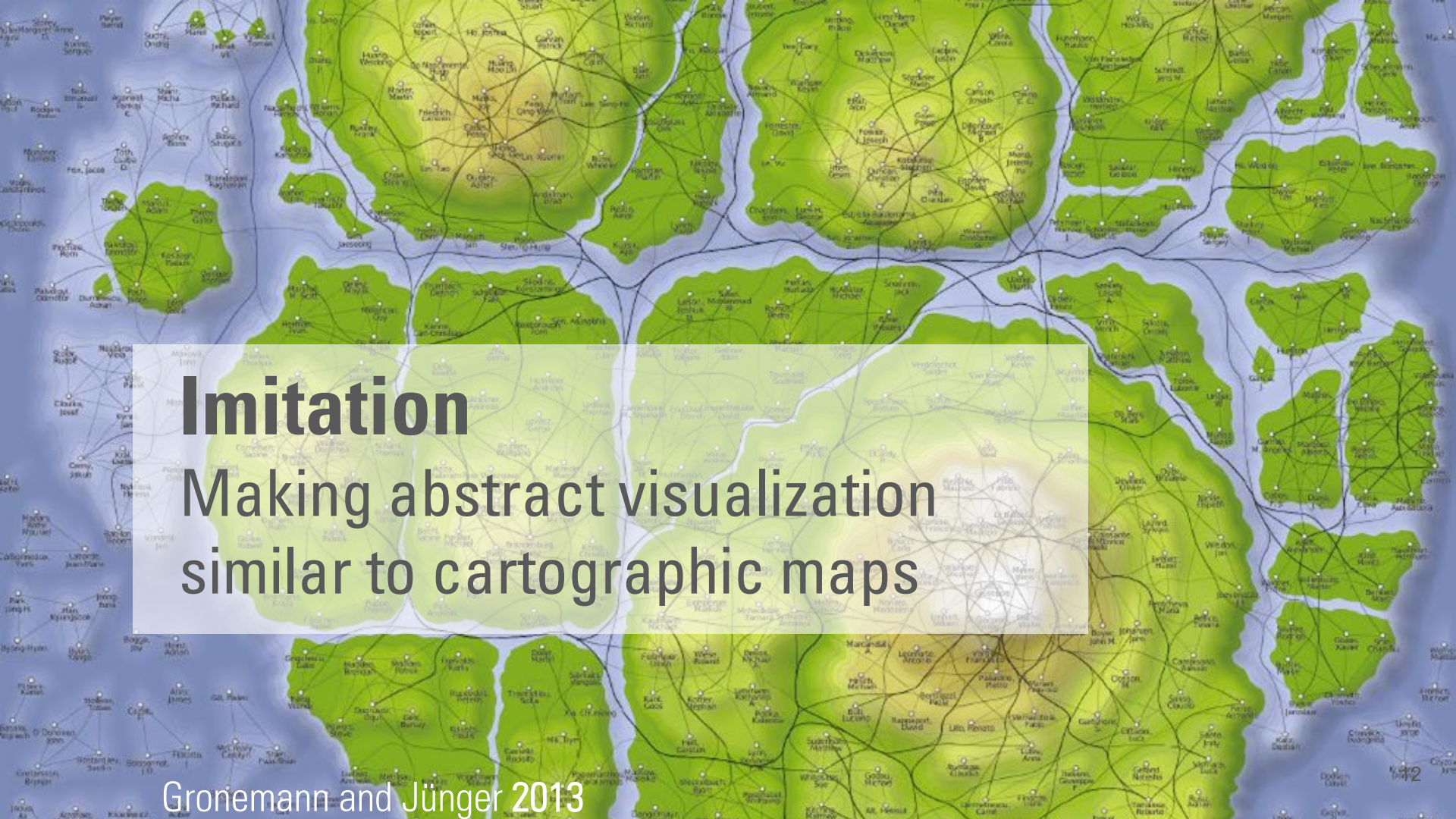
Line

Field





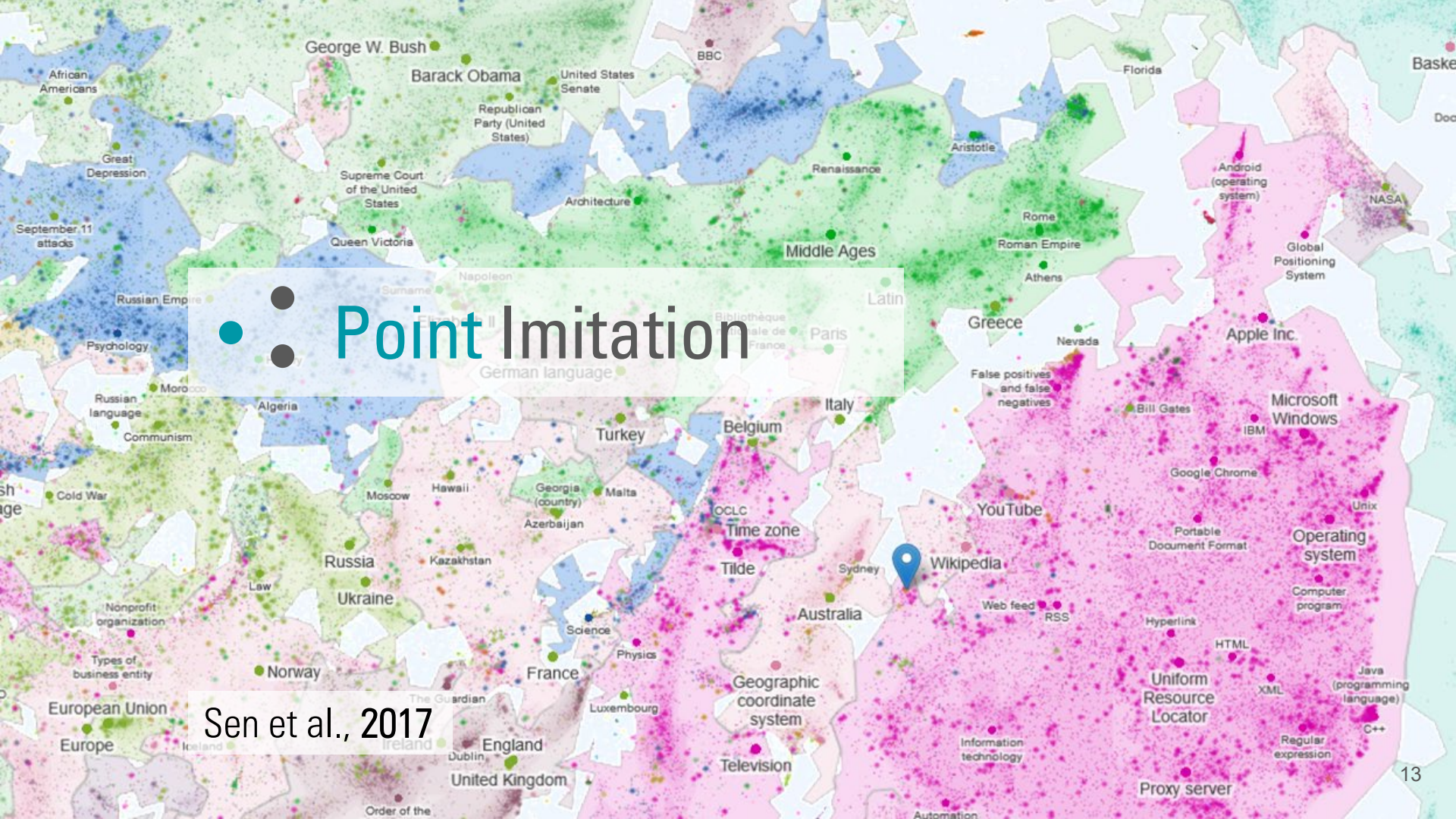
Perspectives ✕ Categories



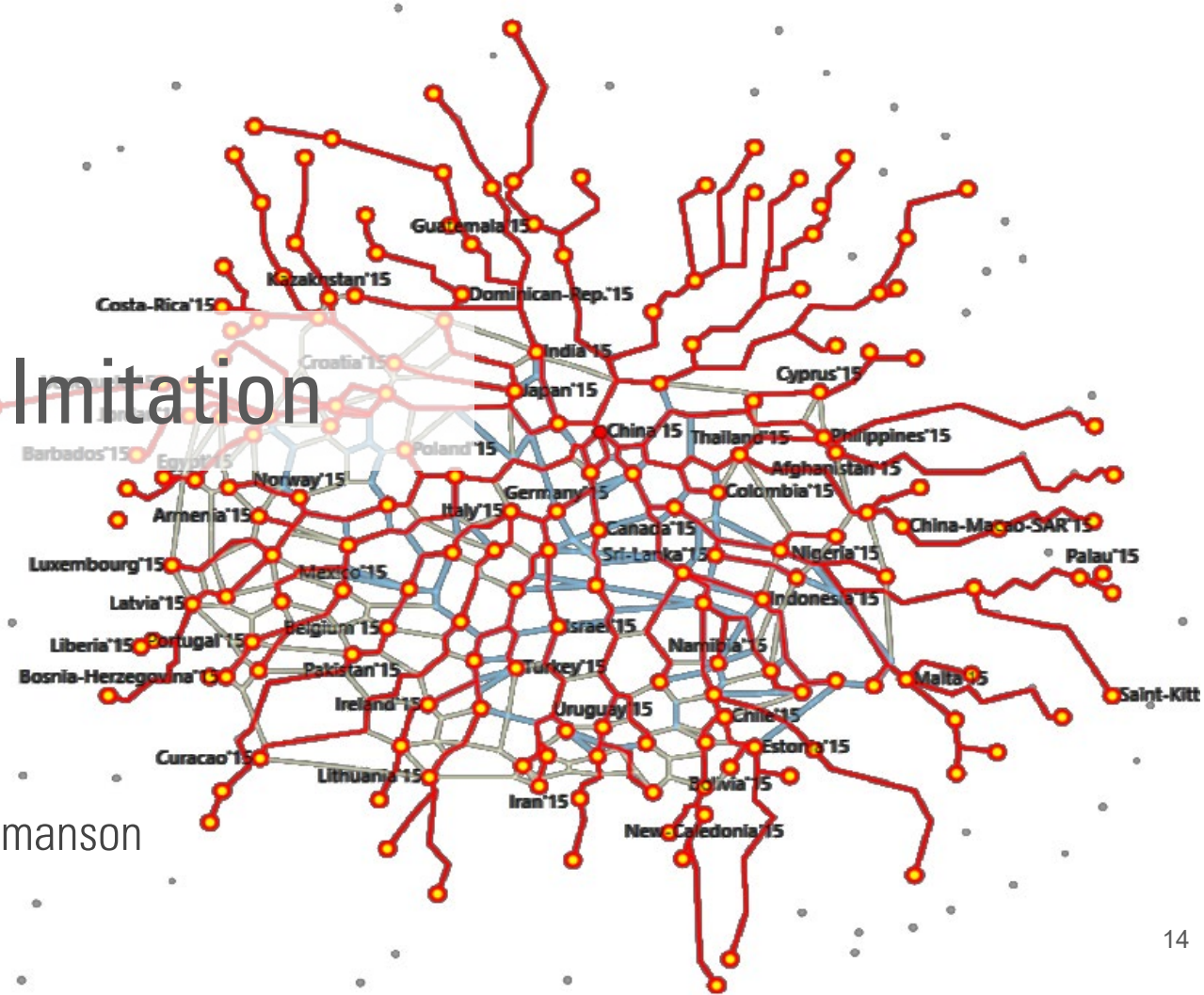
Imitation

Making abstract visualization similar to cartographic maps

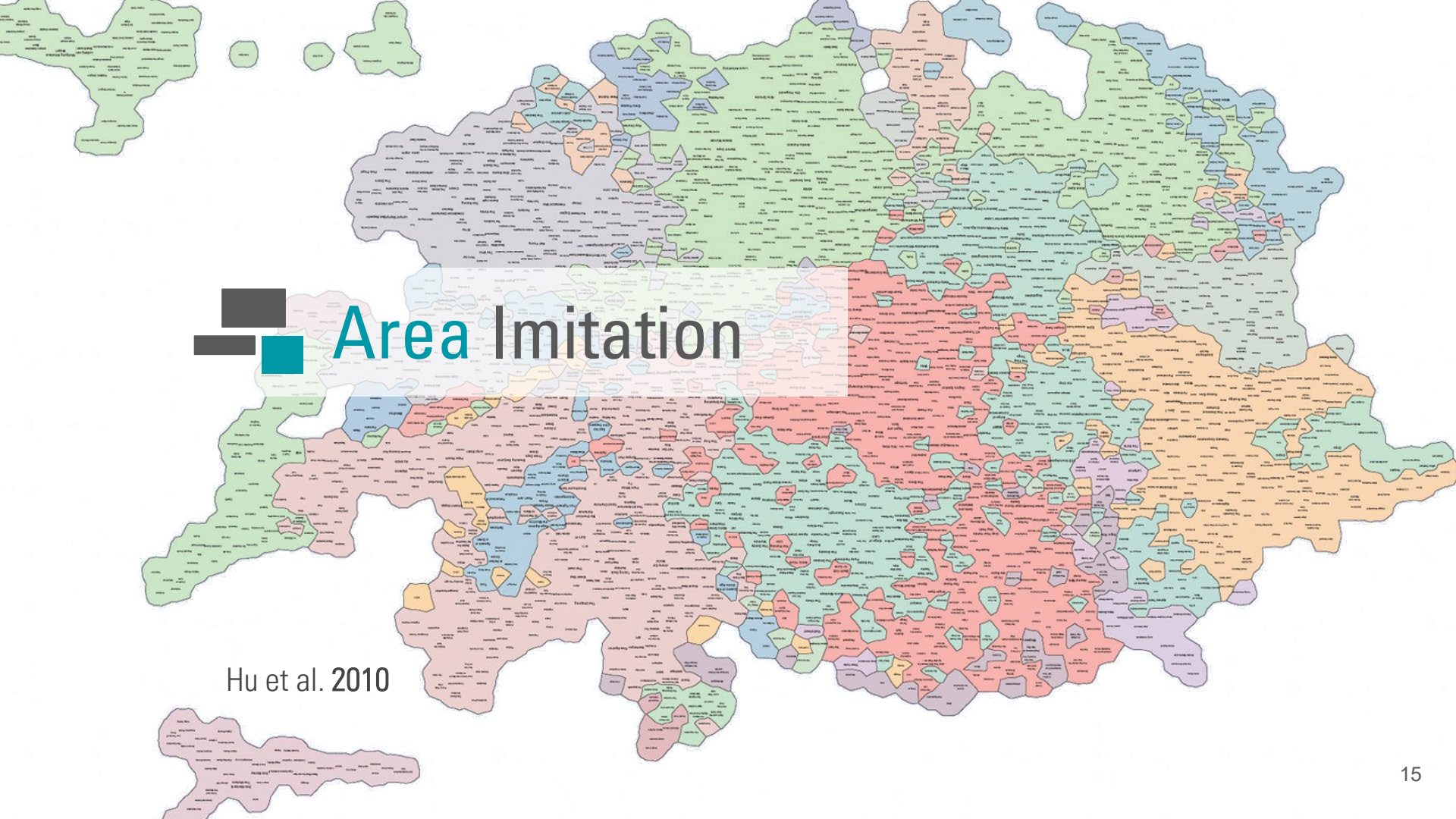
Gronemann and Jünger 2013


Point Imitation
George W. Bush
Barack Obama
United States Senate
Republican Party (United States)
BBC
African Americans
Great Depression
Supreme Court of the United States
Queen Victoria
September 11 attacks
Architecture
Renaissance
Aristotle
Middle Ages
Rome
Roman Empire
Athens
Florida
Android (operating system)
NASA
Global Positioning System
Apple Inc.
Nevada
Greece
Paris
Latin
Napoleon
German language
Psychology
Russian language
Communism
Algeria
Italy
Turkey
Belgium
False positives and false negatives
Bill Gates
Microsoft Windows
IBM
Google Chrome
YouTube
Unix
Portable Document Format
Operating system
Cold War
Moscow
Hawaii
Georgia (country)
Malta
Azerbaijan
OCLC
Time zone
Tilde
Sydney
Wikipedia
Russia
Kazakhstan
Ukraine
Law
Nonprofit organization
Australia
Web feed
RSS
Hyperlink
Computer program
Science
Physics
France
Norway
Types of business entity
European Union
Europe
Luxembourg
Geographic coordinate system
HTML
Uniform Resource Locator
XML
Java (programming language)
C++
Regular expression
Information technology
Television
England
United Kingdom
Dublin
Proxy server
Sen et al., 2017

Line Imitation

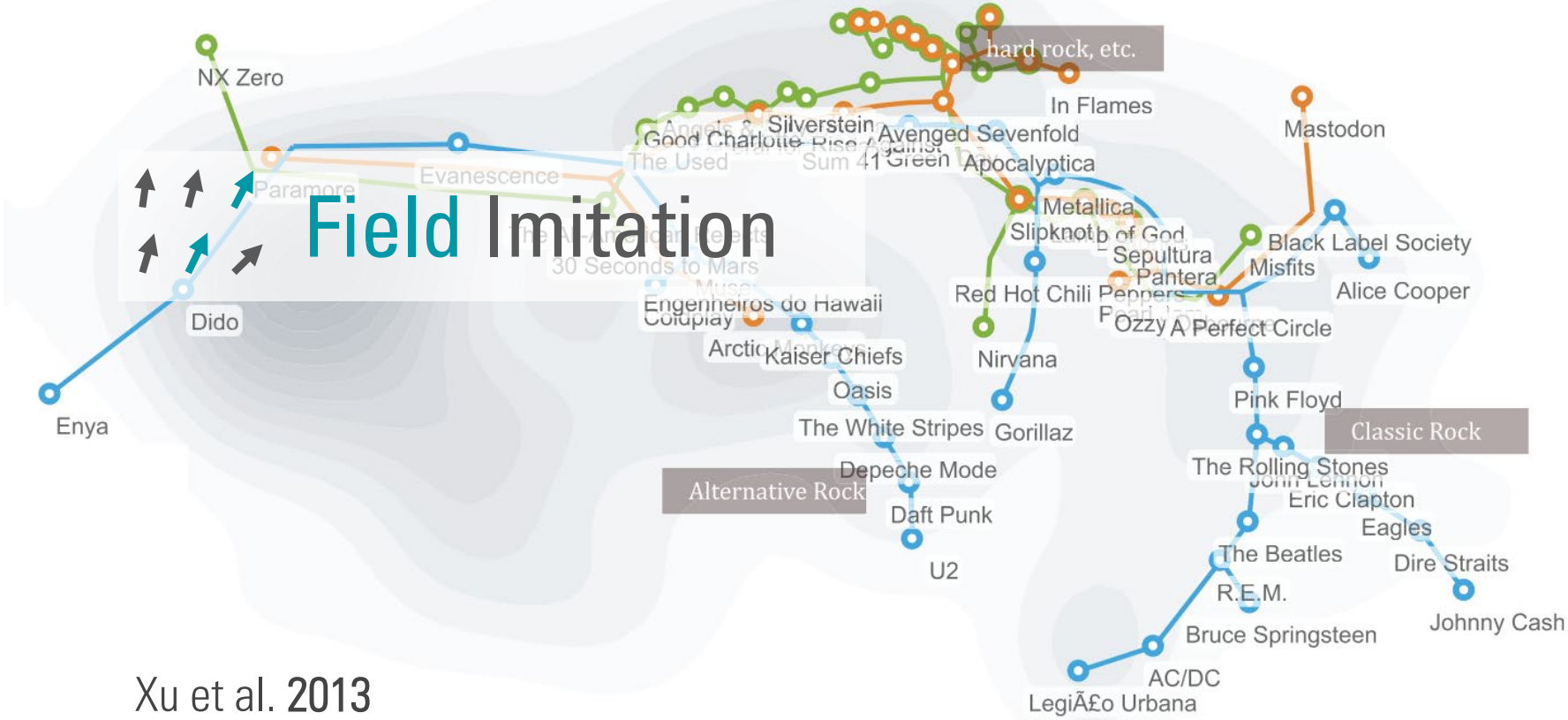


Mondal and Nachmanson
2018

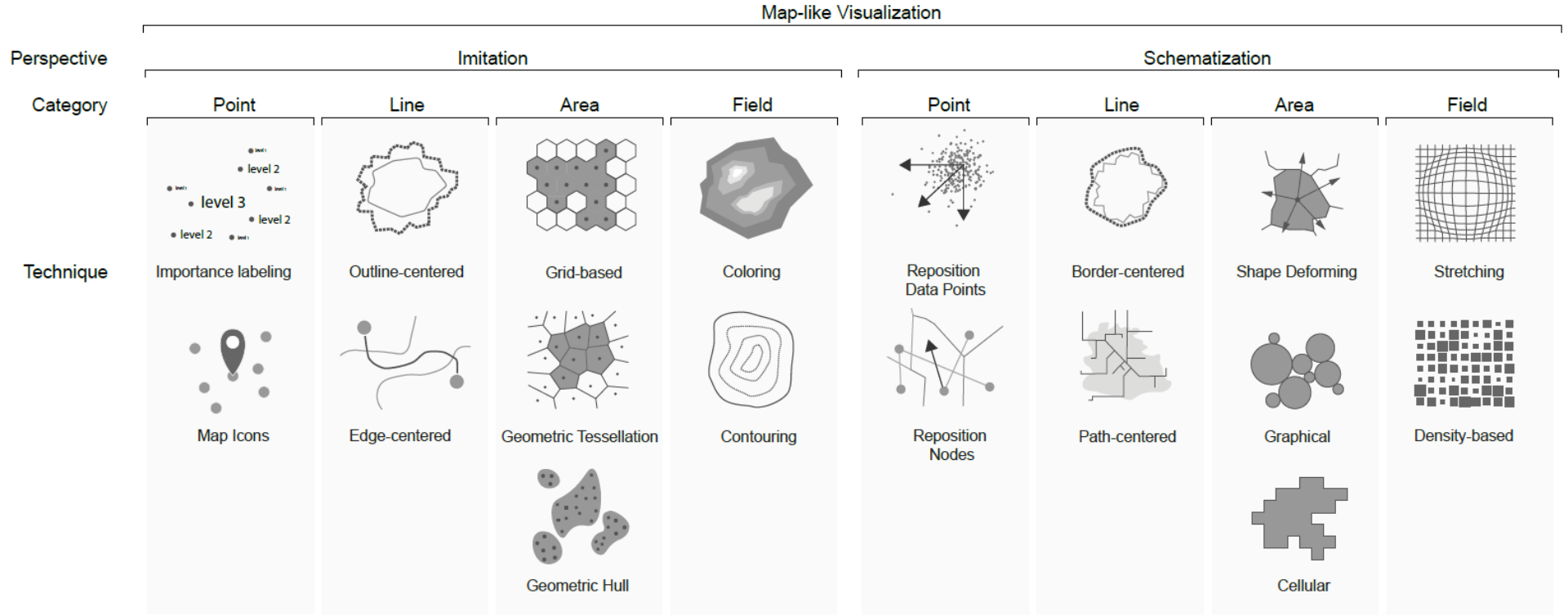


Area Imitation

Hu et al. **2010**


Field Imitation
NX Zero
Paramore
Evanescence
The Used
Dido
Enya
Silverstein
Avenged Sevenfold
Sum 41
Green
Apocalyptica
Metallica
Slipknot
Sepultura
Pantera
Red Hot Chili Peppers
Ozzy
A Perfect Circle
Nirvana
Kaiser Chiefs
Oasis
The White Stripes
Gorillaz
Depeche Mode
Daft Punk
U2
Alternative Rock
In Flames
Mastodon
Black Label Society
Misfits
Alice Cooper
Pink Floyd
Classic Rock
The Rolling Stones
Eric Clapton
Eagles
The Beatles
Dire Straits
R.E.M.
Johnny Cash
Bruce Springsteen
AC/DC

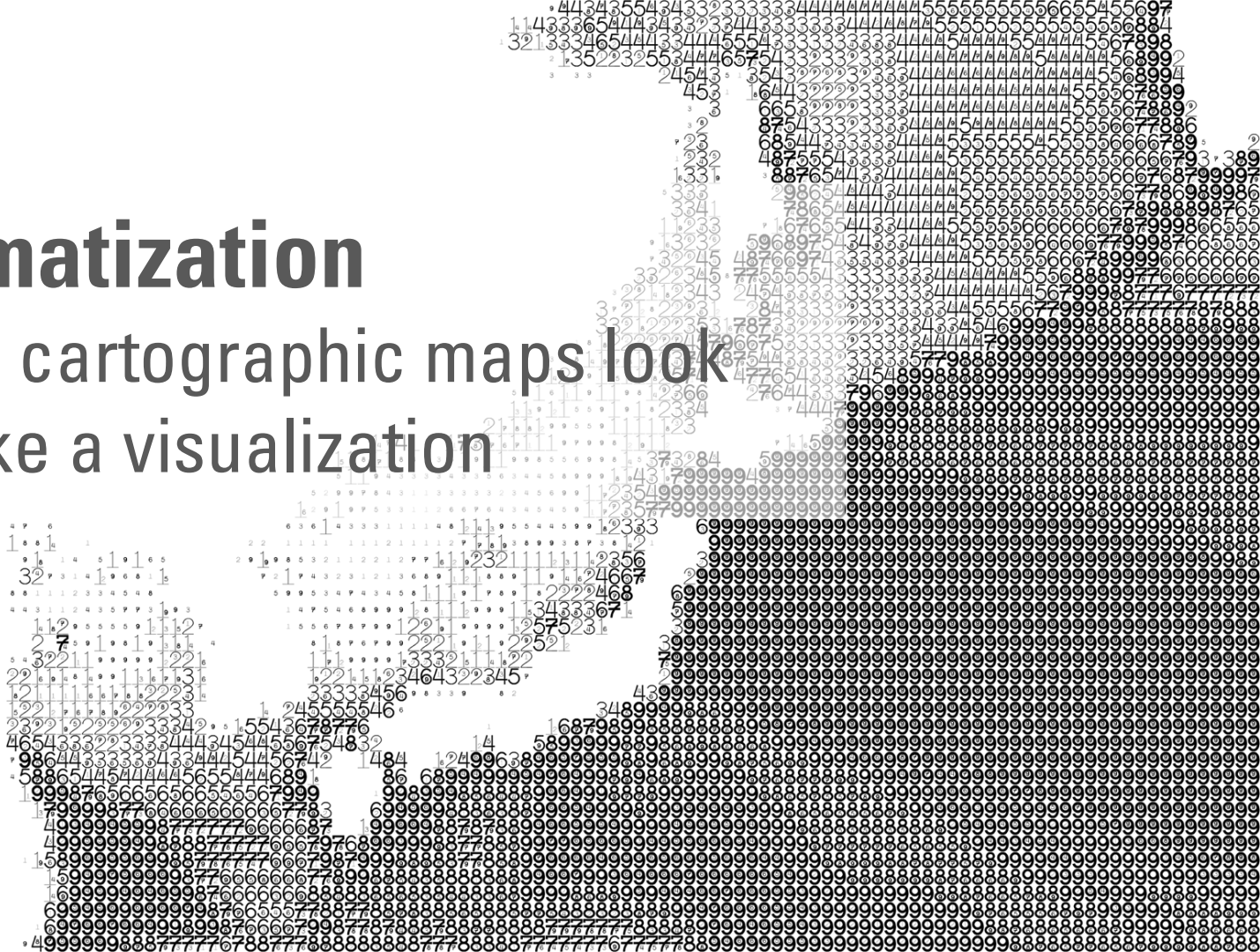
Xu et al. **2013**



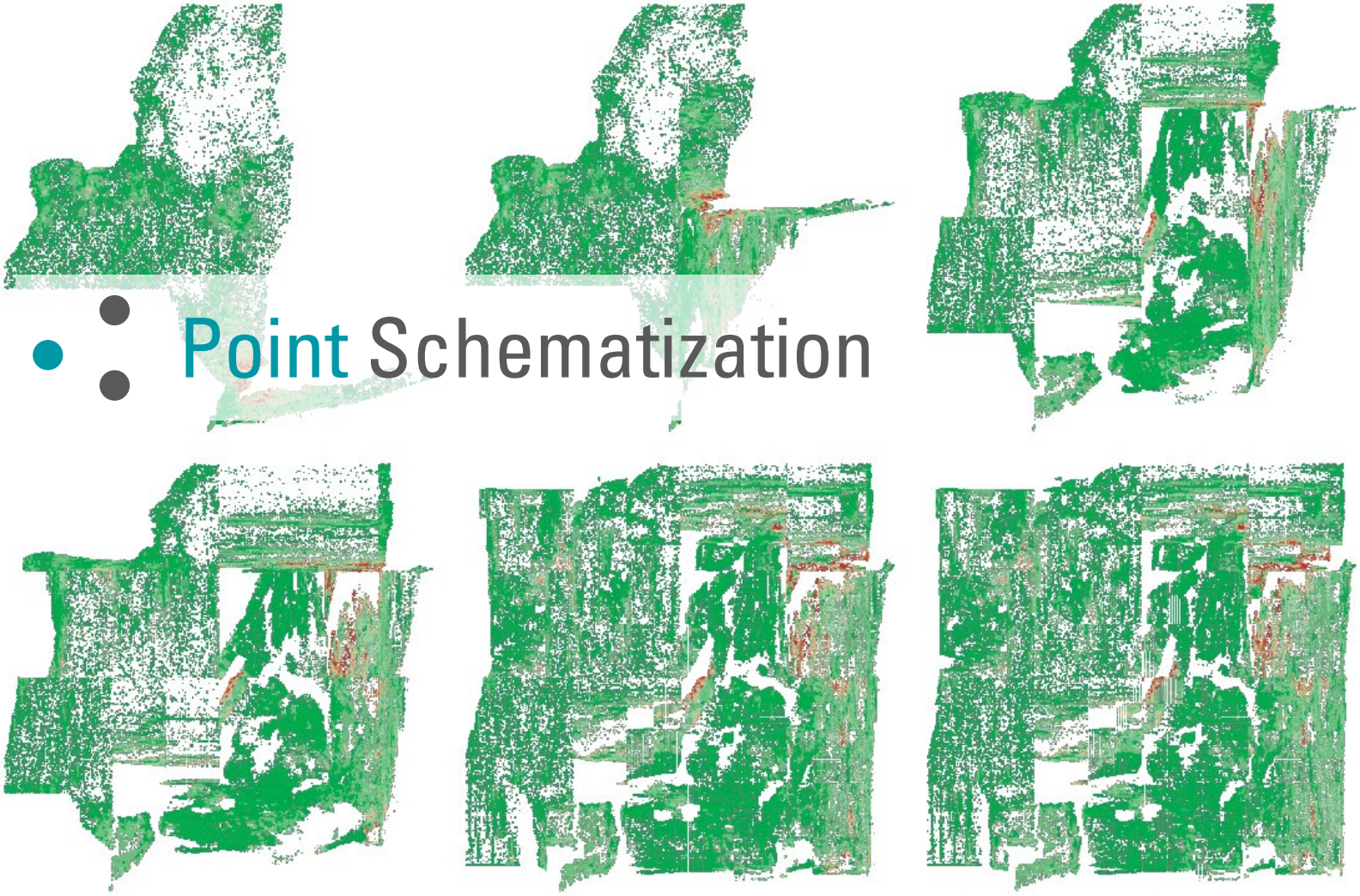
Literature Overview

Schematization

Making cartographic maps look more like a visualization

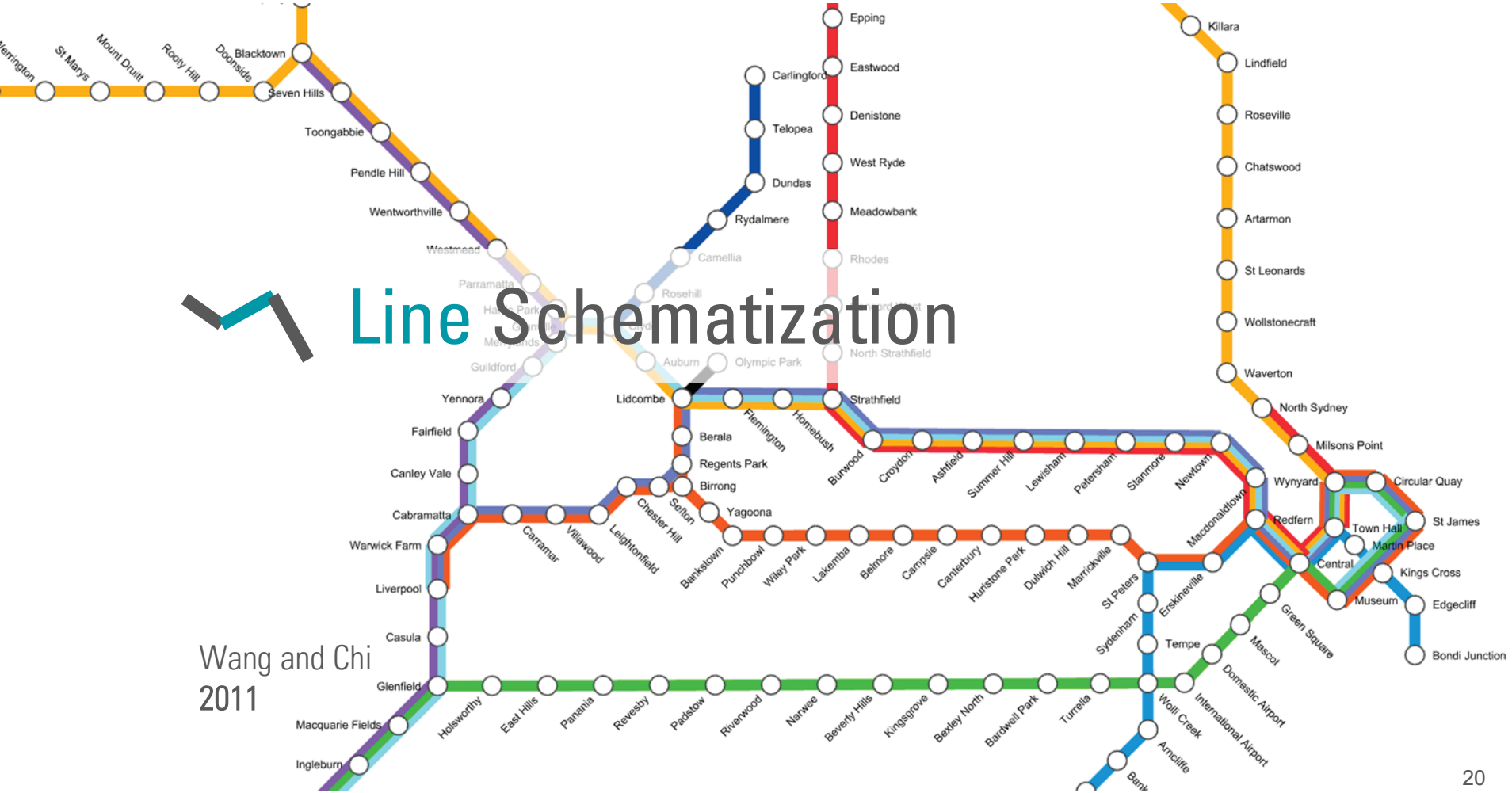


Nacenta et al.
2017

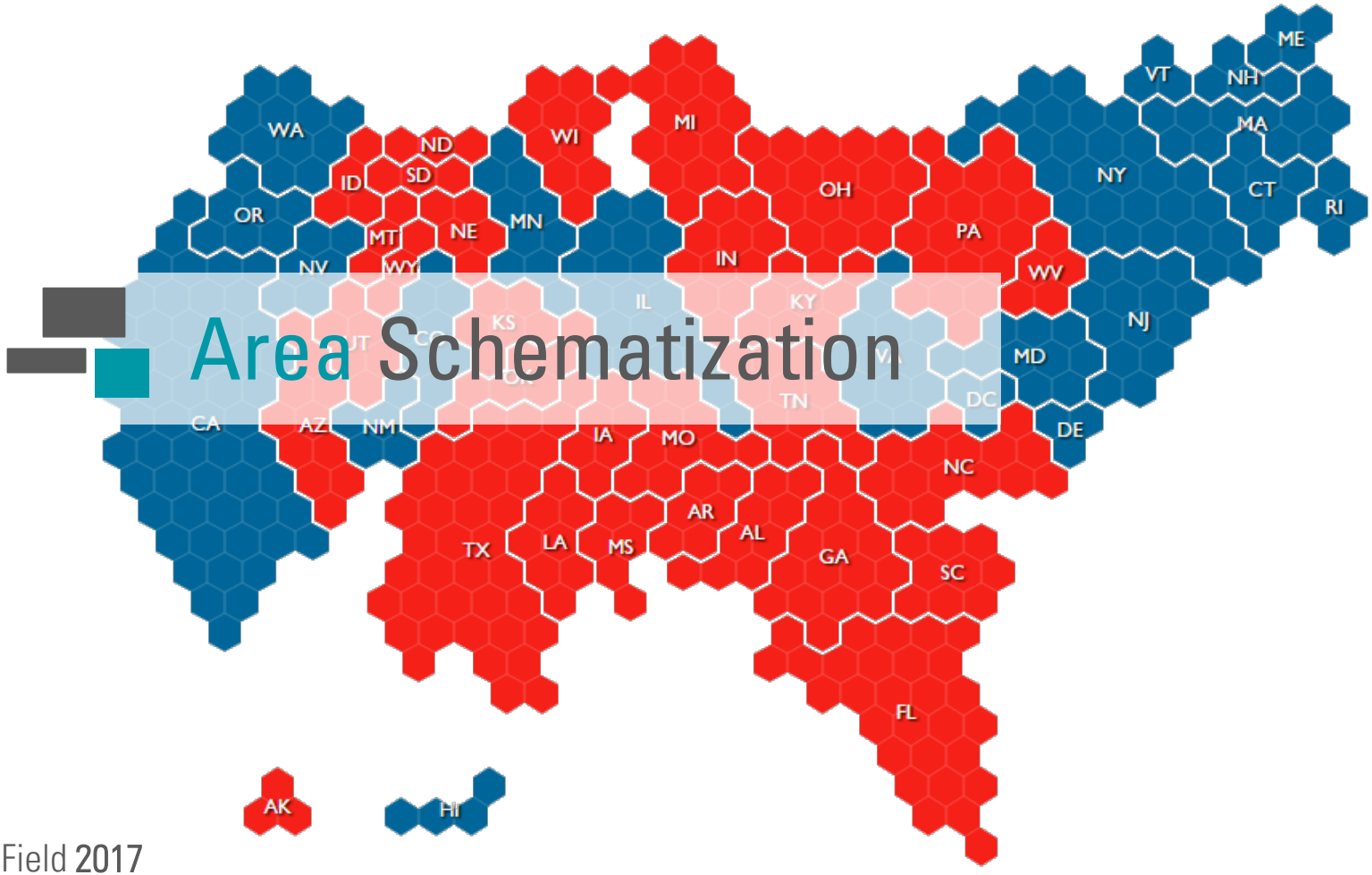


Point Schematization

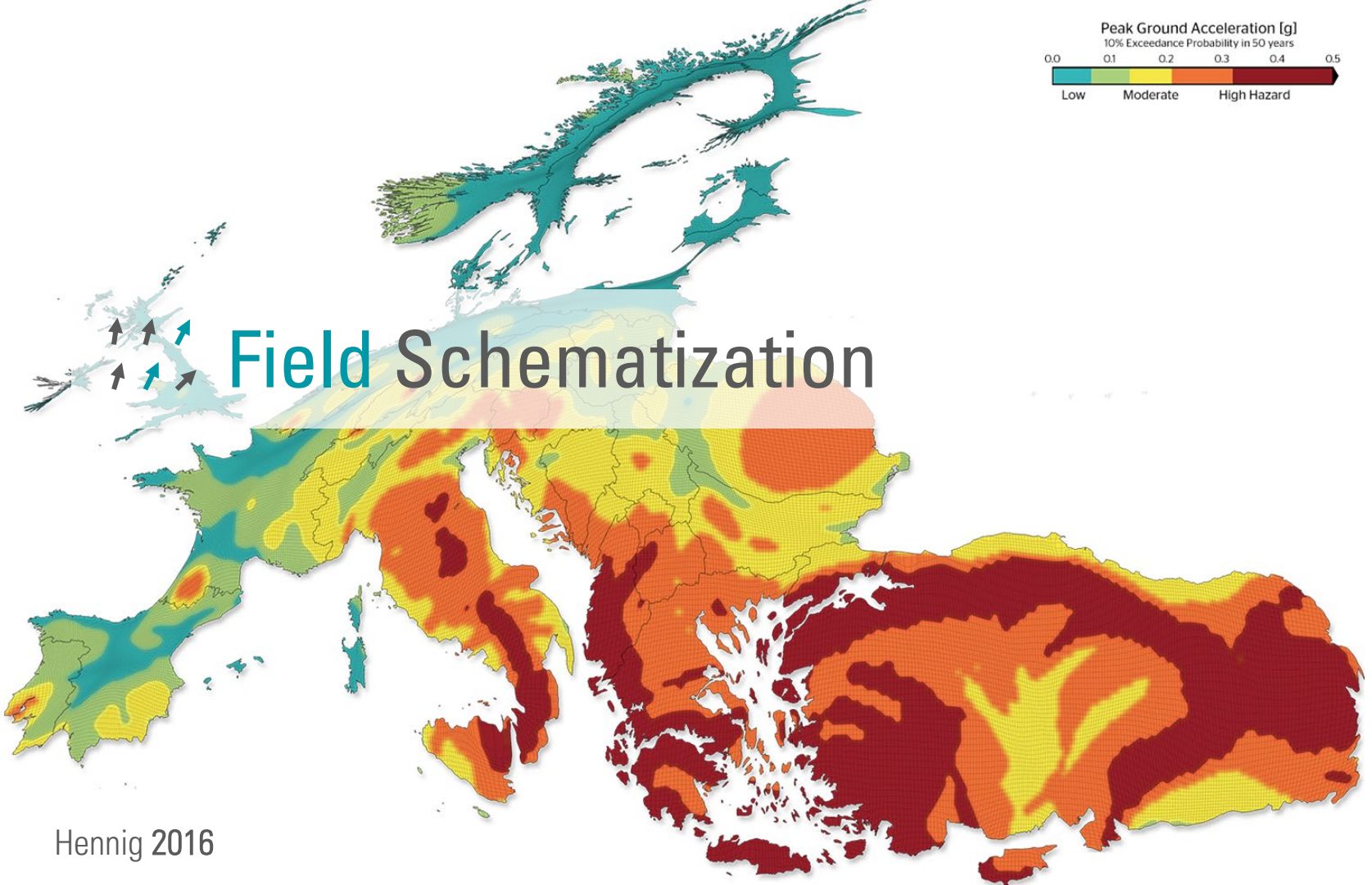
Keim et al.
2003


Line Schematization
Wang and Chi
2011
Epping
Eastwood
Denistone
West Ryde
Meadowbank
Rhodes
North Strathfield
Carlingford
Telopea
Dundas
Rydalmere
Camellia
Rosehill
Auburn
Olympic Park
Lidcombe
Strathfield
Flemington
Homebush
Berala
Regents Park
Birrong
Sefton
Chester Hill
Leightonfield
Villawood
Carramar
Yagoona
Bankstown
Punchbowl
Wiley Park
Lakemba
Belmore
Campsie
Canterbury
Hurlstone Park
Dulwich Hill
Marrickville
Burwood
Croydon
Ashfield
Summer Hill
Lewisham
Petersham
Stanmore
Newtown
Killara
Lindfield
Roseville
Chatswood
Artarmon
St Leonards
Wollstonecraft
Waverton
North Sydney
Milsons Point
Wynyard
Circular Quay
Redfern
Town Hall
St James
Martin Place
Central
Kings Cross
Museum
Edgecliff
Bondi Junction
Macdonaldtown
St Peters
Erskineville
Sydenham
Tempe
Mascot
Green Square
Domestic Airport
International Airport
Wolli Creek
Arncliffe
Bank
Turrella
Bardwell Park
Bexley North
Kingsgrove
Beverly Hills
Narwee
Riverwood
Padstow
Revesby
Panania
East Hills
Holsworthy
Glenfield
Macquarie Fields
Ingleburn
Casula
Liverpool
Warwick Farm
Cabramatta
Canley Vale
Fairfield
Yennora
Guildford
Parramatta
Westmead
Wentworthville
Pendle Hill
Toongabbie
Seven Hills
Doonside
Blacktown
Rooty Hill
Mount Druitt
St Marys

Area Schematization



Field 2017

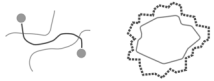


Field Schematization

Hennig 2016

Applying
Map-like Visualization

Imitation

- Point
- Line 
- Area 
- Field 

Schematization

Gronemann and Jünger 2013

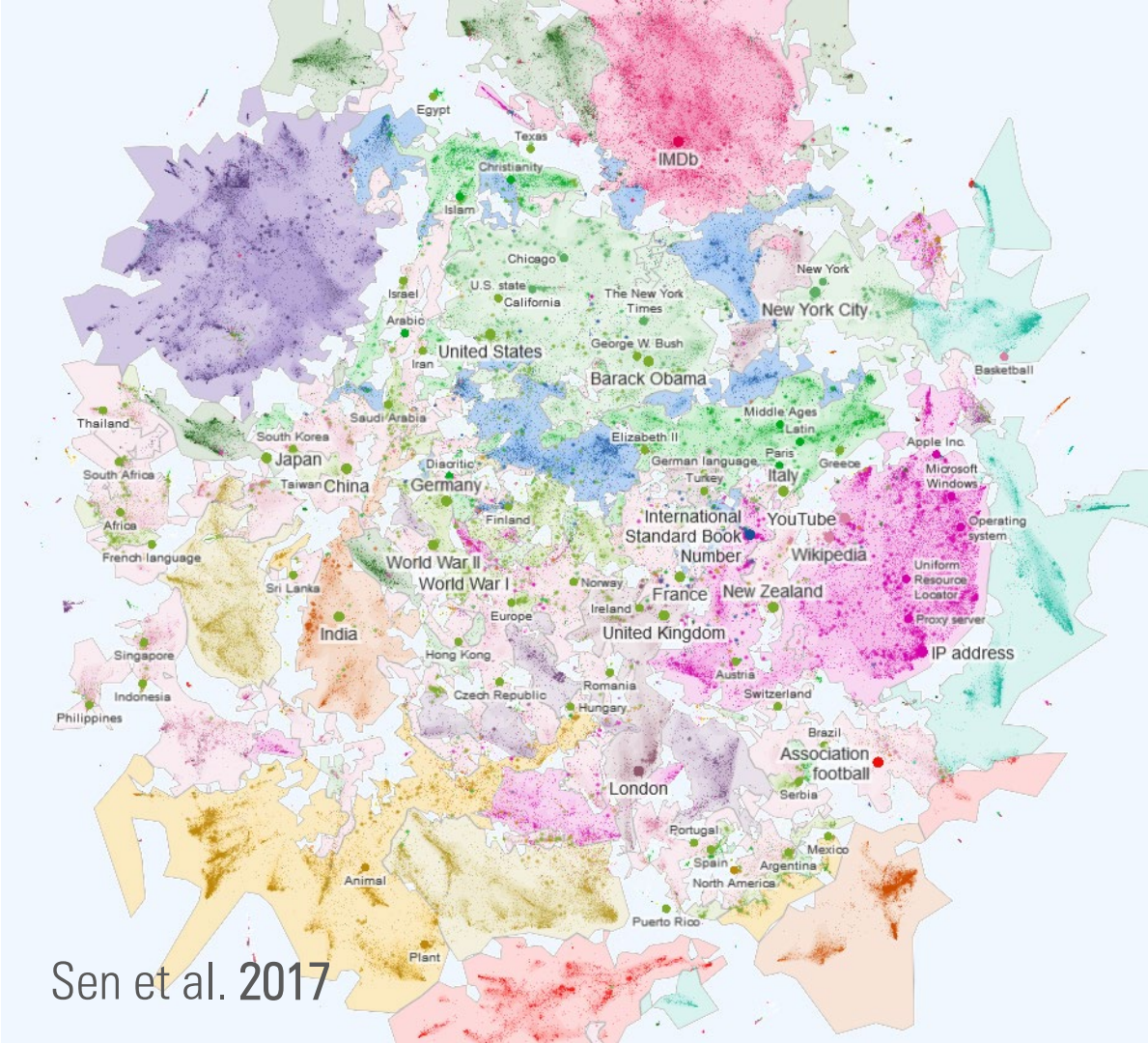
Imitation

- Point

- Line
- Area

- Field

Schematization



Sen et al. 2017

Using
Map-like Visualization

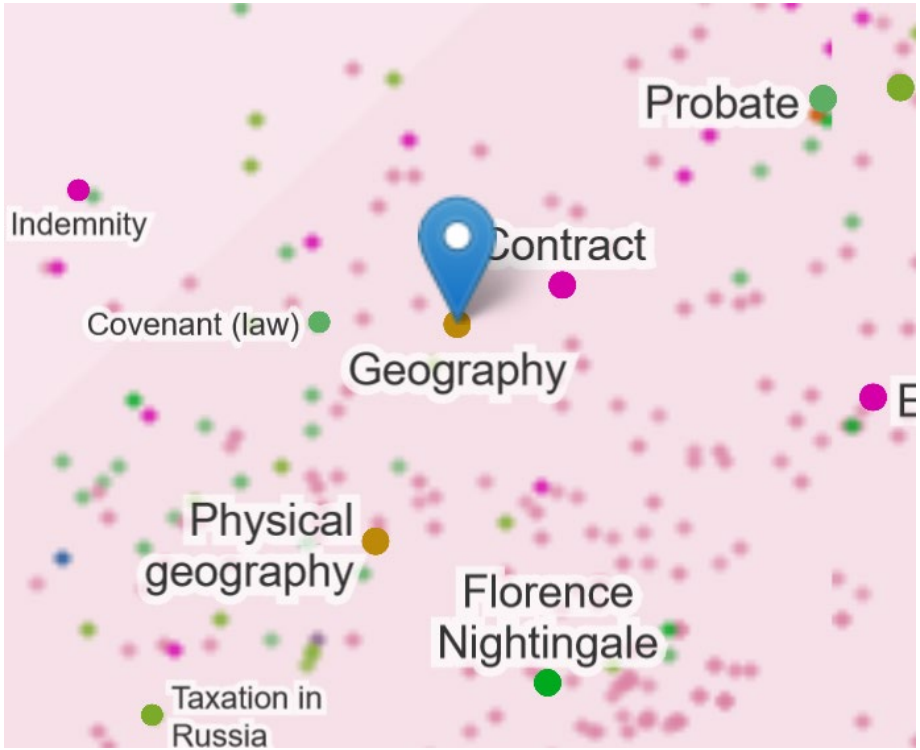
Identify Location

Retrieve Value

Assess Distance

Trace Path

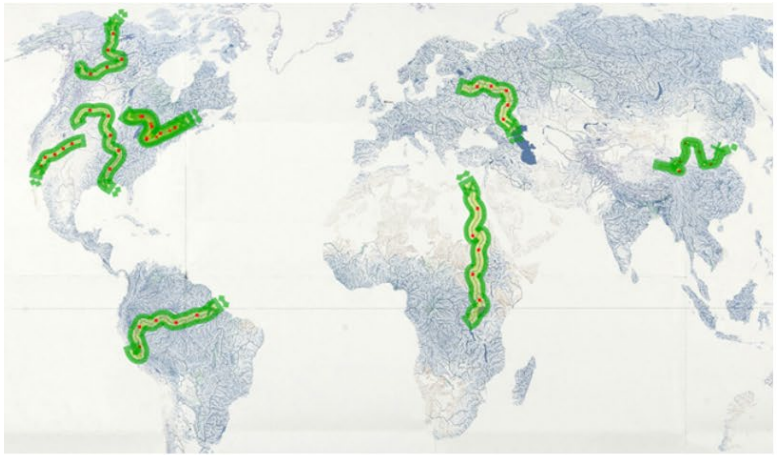
Identify Location

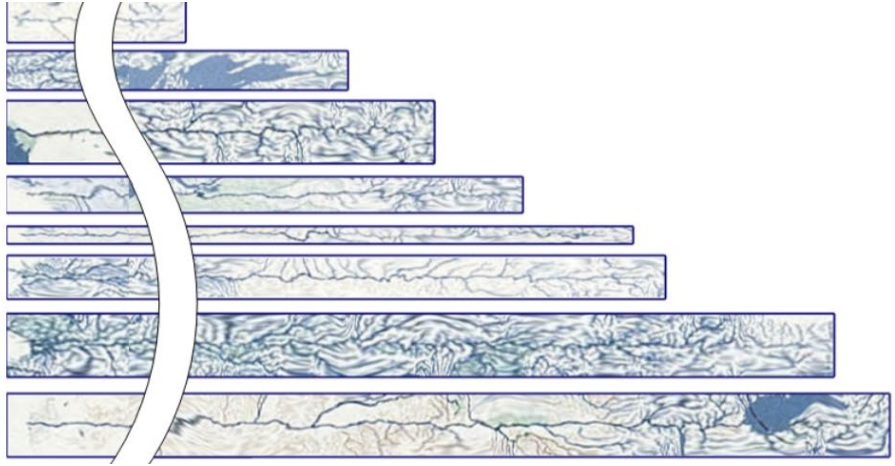


Sen et al. 2017

Retrieve Value

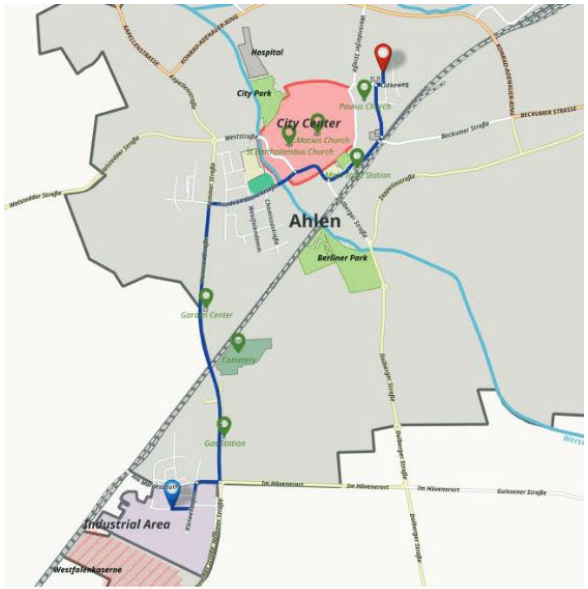
Assess Distance

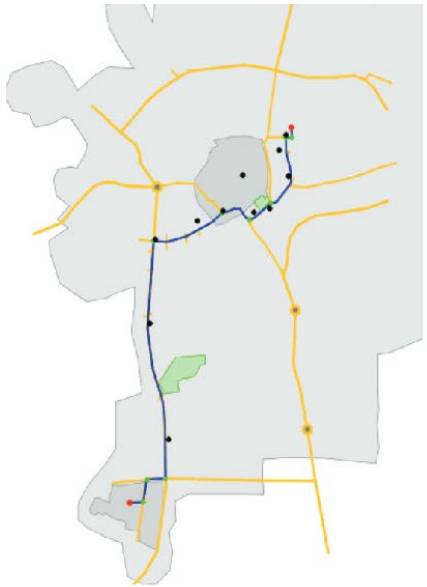


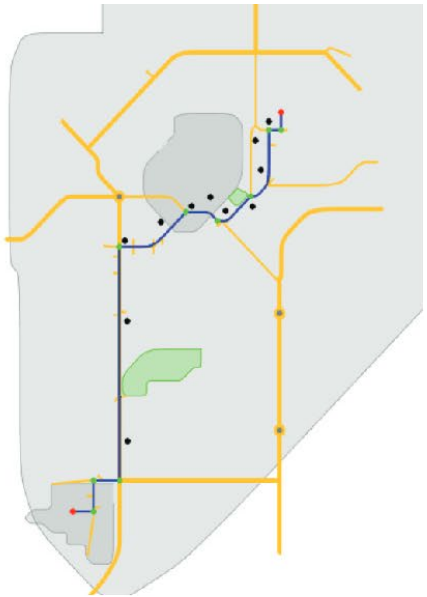


Brosz et al. **2013**

Trace Path



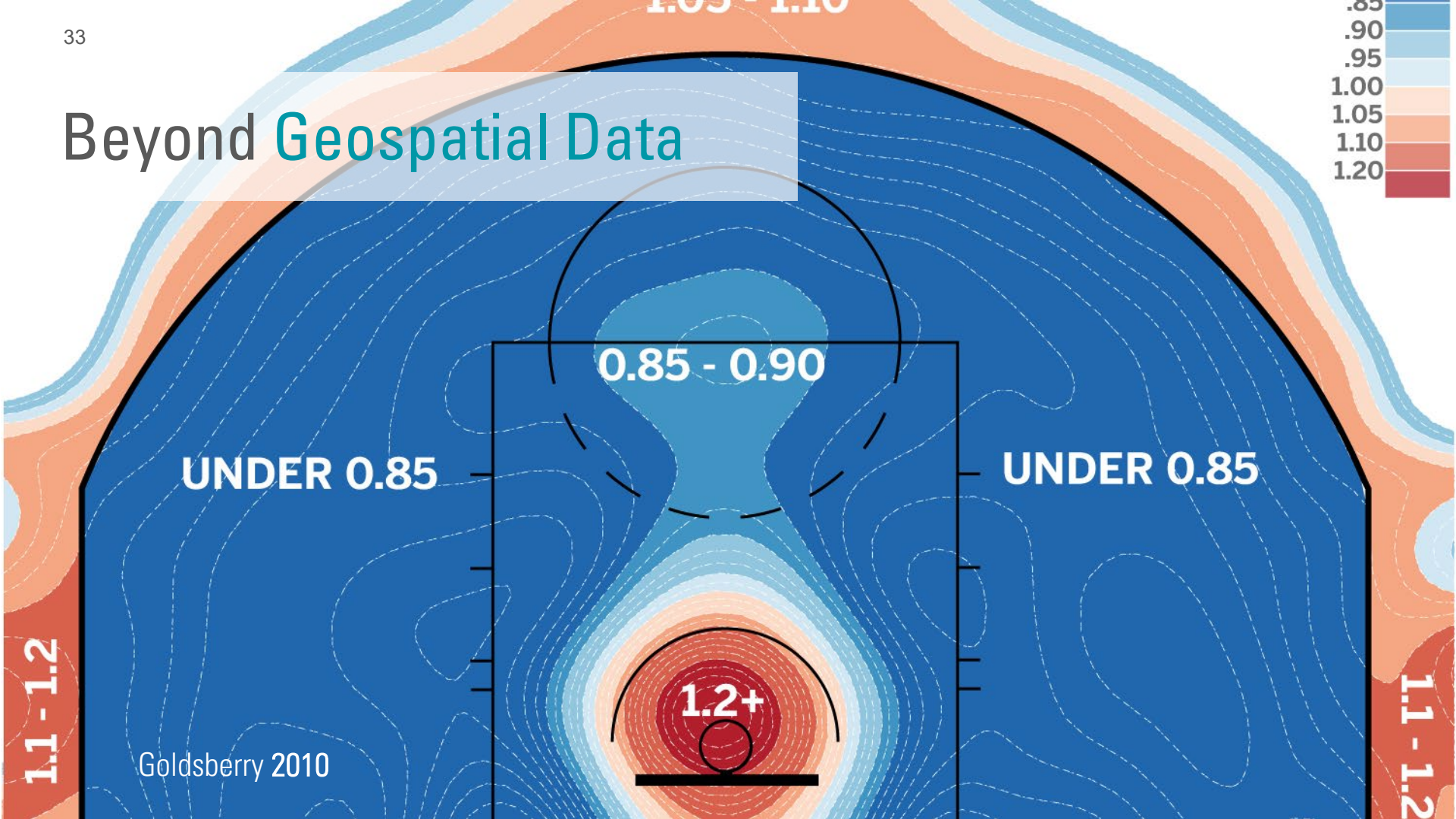




Schwering et al. **2019**

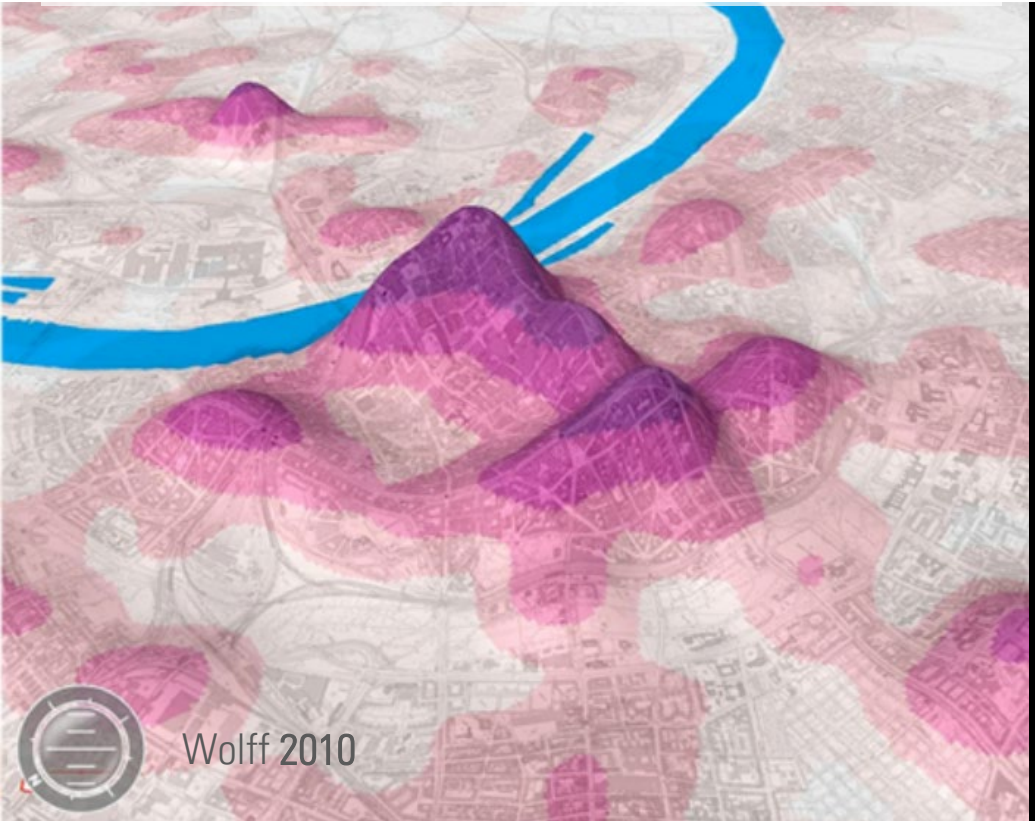
Expanding
Map-like Visualization

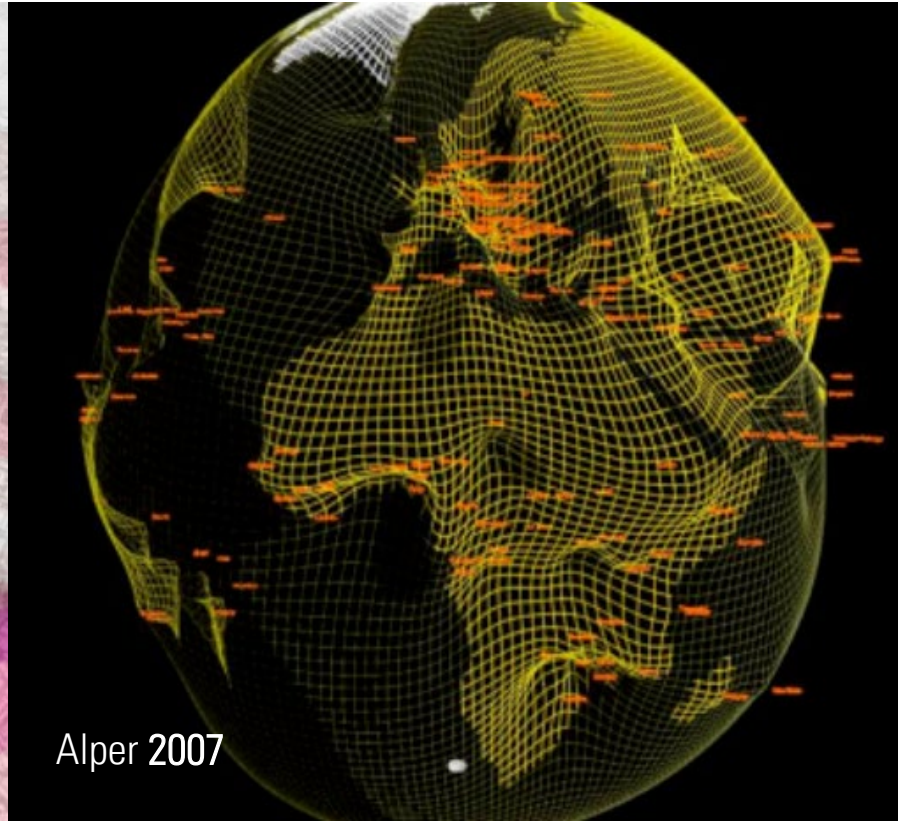
Beyond Geospatial Data



Goldsberry 2010

Beyond Maps





Contributions

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- **Literature Overview** of existing map-like techniques

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tinyurl.com/maplike