Maps & Macroscopes:

Gaining Insights from BIG Data

Local Short-term Decisions	vs.	Global Long-term Decisions

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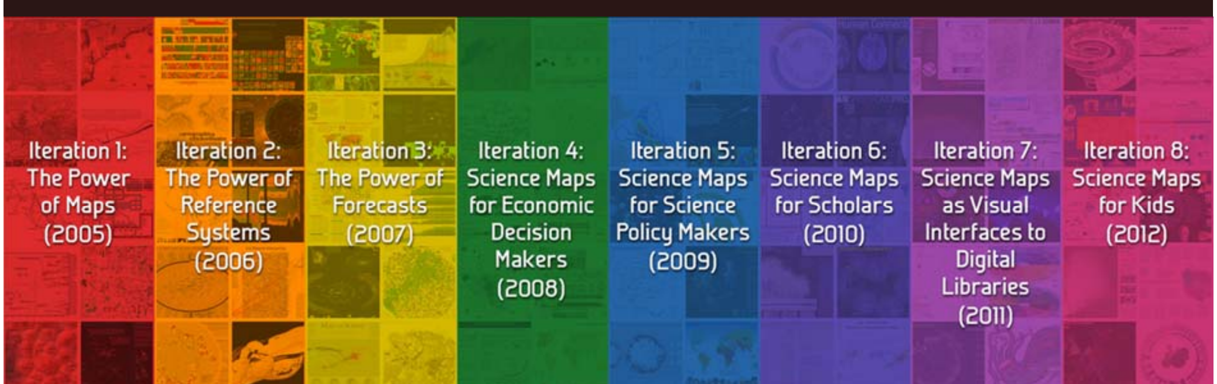
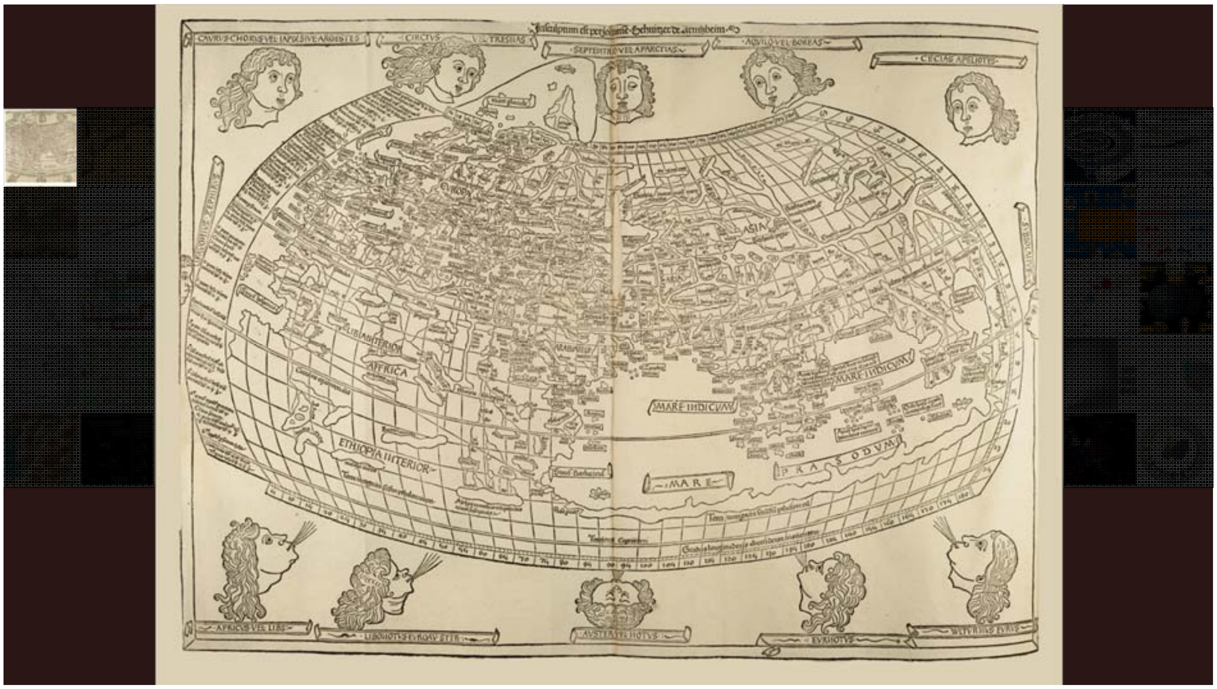
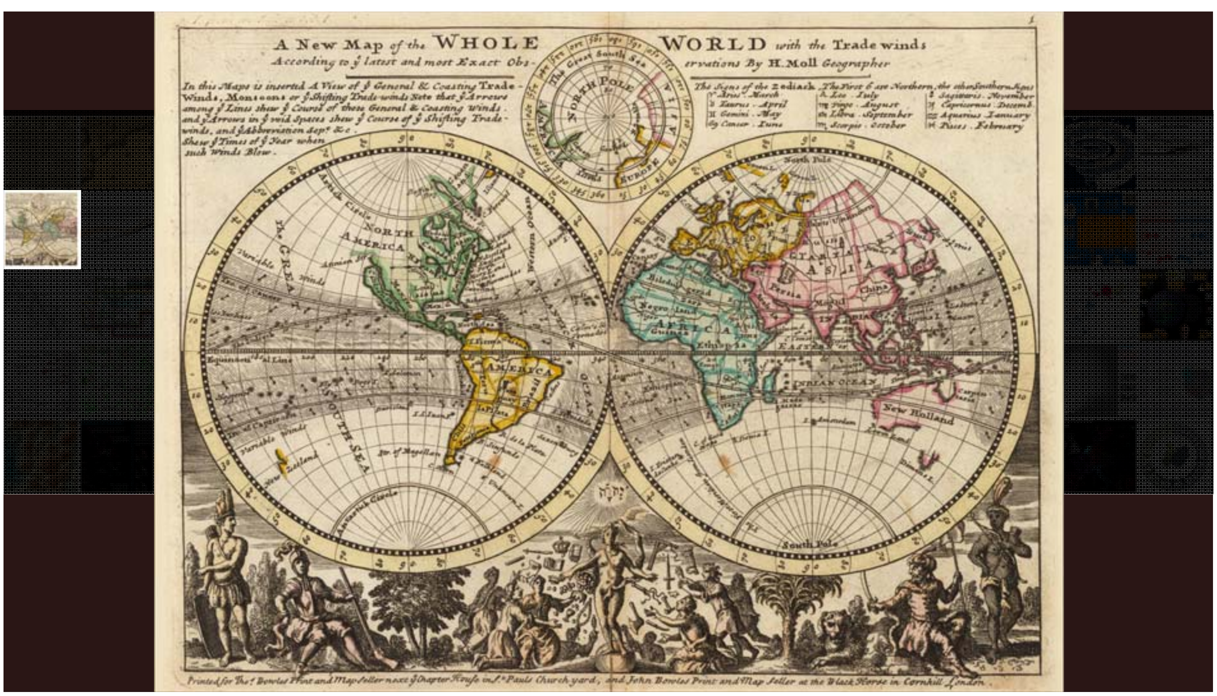
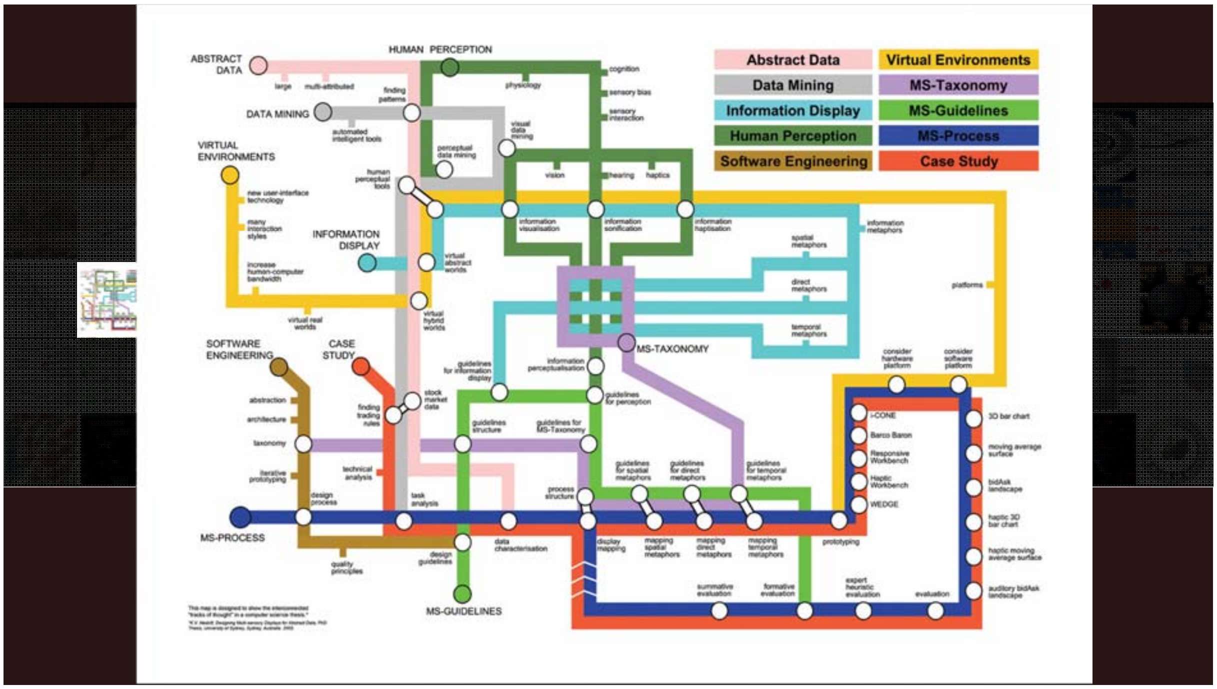
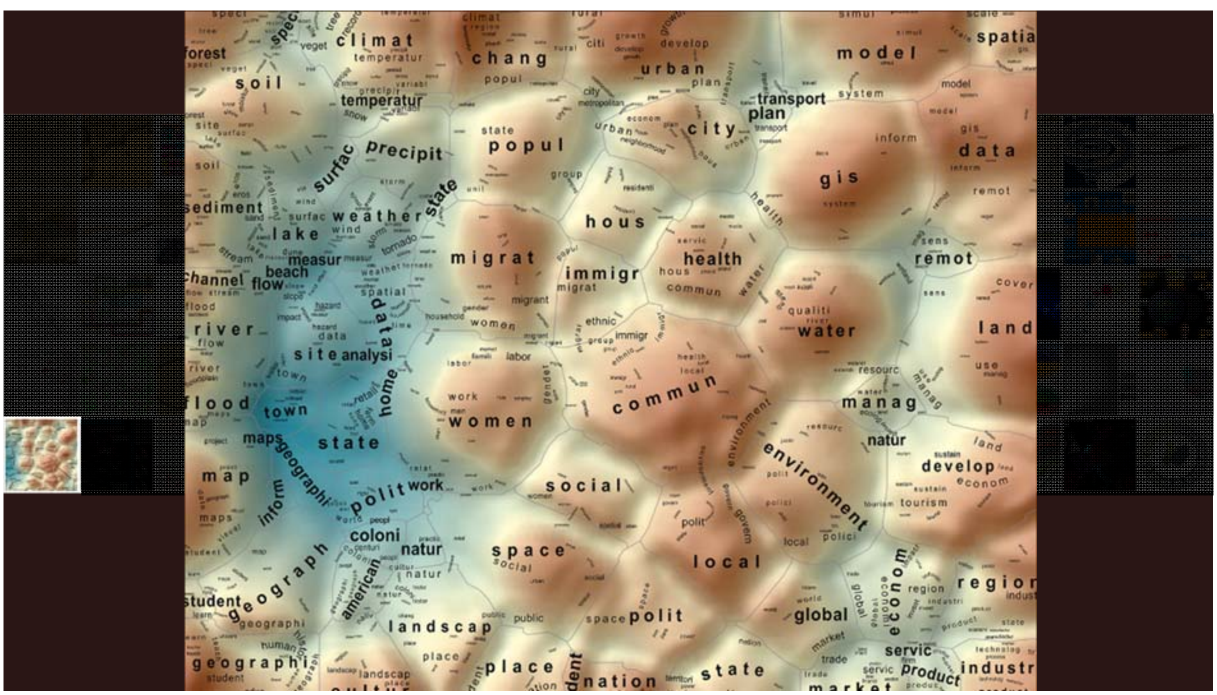



AFRICA
ASIA
ETHIOPIA INTERIOR
MARE INDICUM
MARE
PRASODUM
AFRICUS VEL LIBS
AUSTER VEL NOTUS
EURONOTUS


A New Map of the WHOLE WORLD with the Trade winds
According to ye latest and most Exact Observations By H.Moll Geographer
NORTH AMERICA
SOUTH AMERICA
AFRICA
ASIA
New Holland
INDIAN OCEAN
North Pole
South Pole


Abstract Data
Virtual Environments
Data Mining
MS-Taxonomy
Information Display
MS-Guidelines
Human Perception
MS-Process
Software Engineering
Case Study
ABSTRACT DATA
HUMAN PERCEPTION
DATA MINING
VIRTUAL ENVIRONMENTS
INFORMATION DISPLAY
SOFTWARE ENGINEERING
CASE STUDY
MS-TAXONOMY
MS-PROCESS
MS-GUIDELINES
cognition
sensory bias
physiology
finding patterns
vision
hearing
haptics
information visualisation
information sonification
information haptisation
information metaphors
spatial metaphors
direct metaphors
temporal metaphors
platforms
consider hardware platform
consider software platform
I-CONE
Barco Baron
Responsive Workbench
Haptic Workbench
WEDGE
3D bar chart
moving average surface
bidAsk landscape
haptic 3D bar chart
haptic moving average surface
auditory bidAsk landscape
abstraction
architecture
taxonomy
iterative prototyping
design process
quality principles
technical analysis
task analysis
data characterisation
design guidelines
display mapping
prototyping
summative evaluation
formative evaluation
expert heuristic evaluation
evaluation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temperatur
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site analysi
flood
town
commun
manag
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natur
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polit
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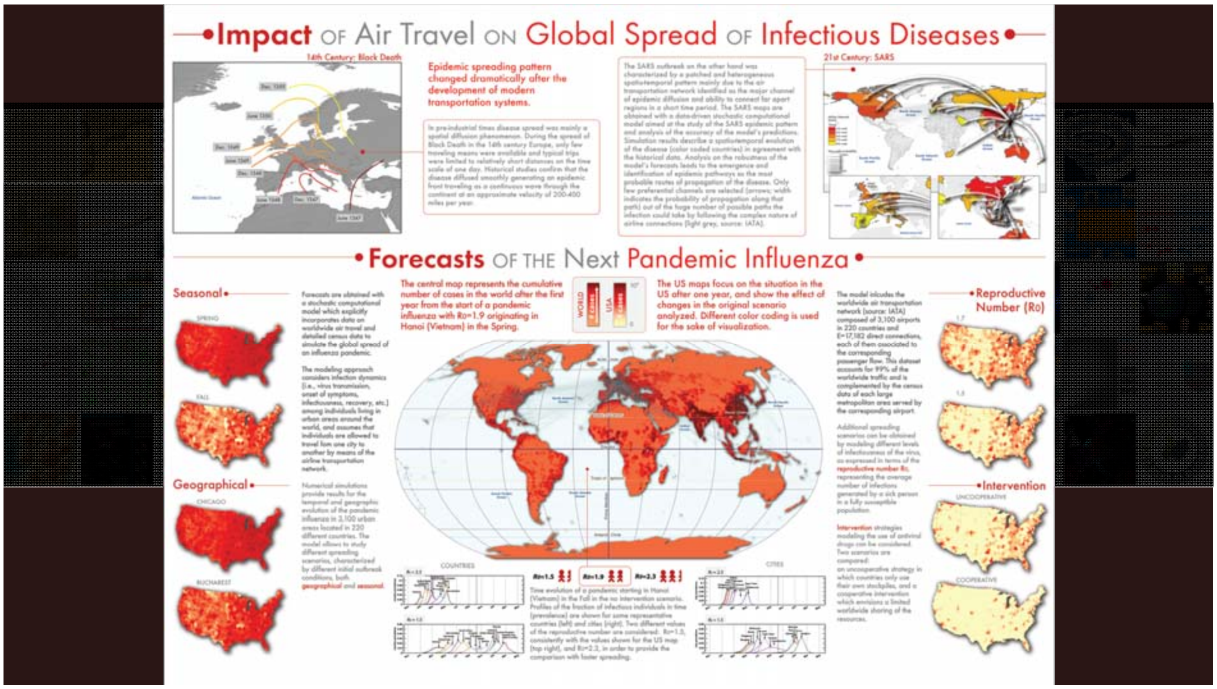
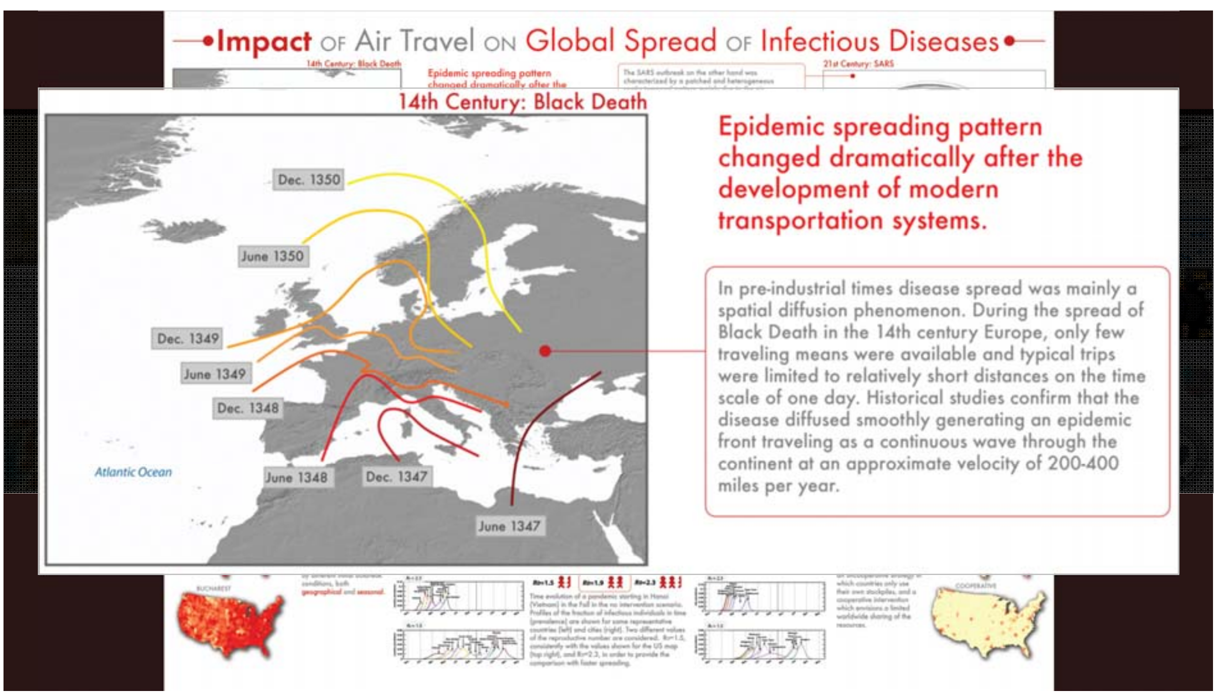
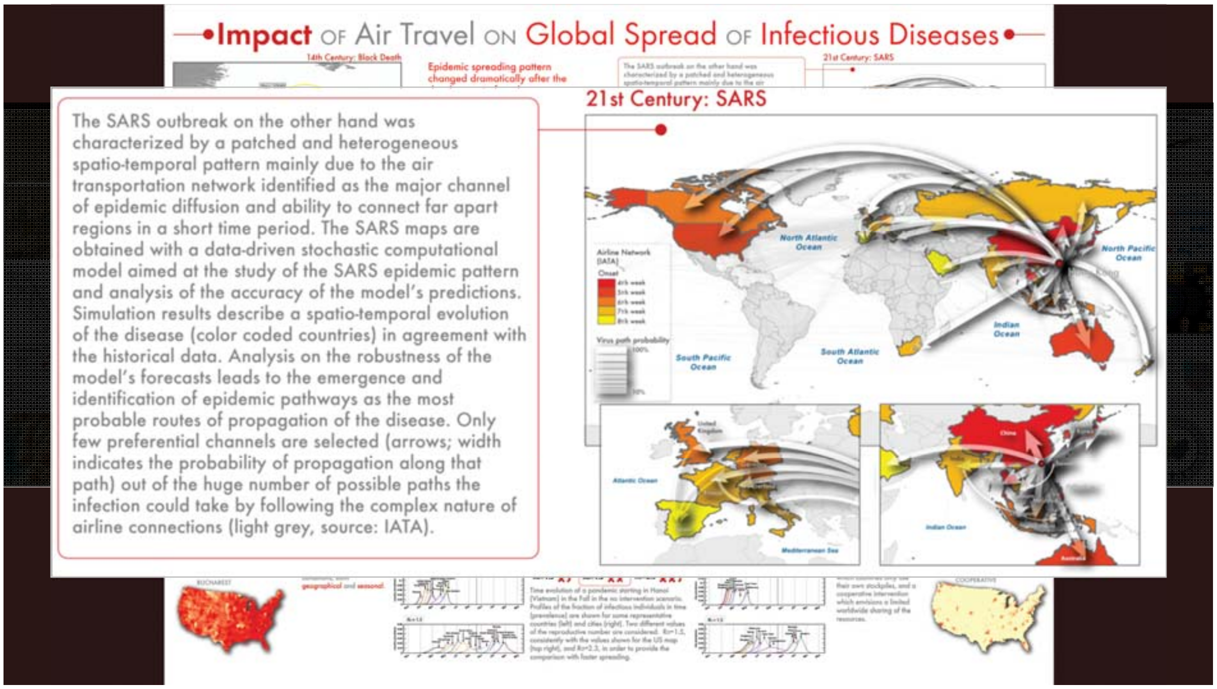
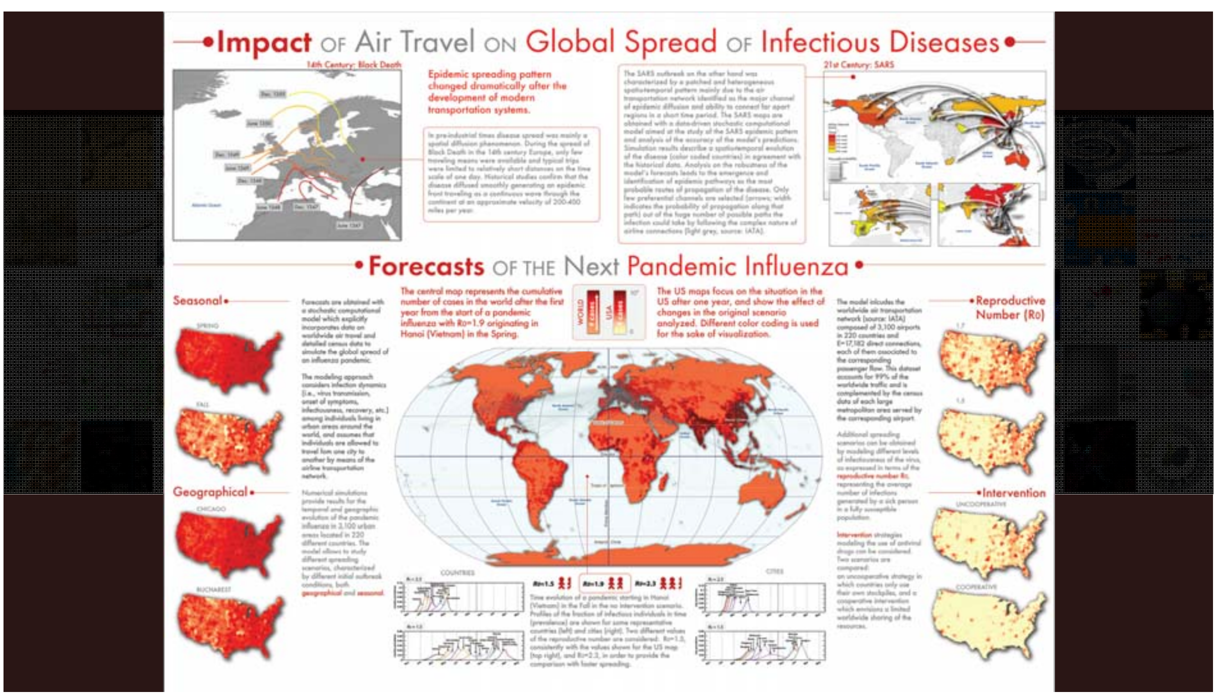

Impact OF Air Travel ON Global Spread OF Infectious Diseases
14th Century: Black Death
Epidemic spreading pattern changed dramatically after the development of modern transportation systems.
21st Century: SARS
Forecasts OF THE Next Pandemic Influenza
Seasonal
Geographical
The central map represents the cumulative number of cases in the world after the first year from the start of a pandemic influenza with R0=1.9 originating in Hanoi (Vietnam) in the Spring.
The US maps focus on the situation in the US after one year, and show the effect of changes in the original scenario analyzed. Different color coding is used for the sake of visualization.
Reproductive Number (R0)
Intervention


14th Century: Black Death
Dec. 1350
June 1350
Dec. 1349
June 1349
Dec. 1348
June 1348
Dec. 1347
June 1347
Atlantic Ocean
Epidemic spreading pattern changed dramatically after the development of modern transportation systems.
In pre-industrial times disease spread was mainly a spatial diffusion phenomenon. During the spread of Black Death in the 14th century Europe, only few traveling means were available and typical trips were limited to relatively short distances on the time scale of one day. Historical studies confirm that the disease diffused smoothly generating an epidemic front traveling as a continuous wave through the continent at an approximate velocity of 200-400 miles per year.



Impact OF Air Travel ON Global Spread OF Infectious Diseases
21st Century: SARS
The SARS outbreak on the other hand was characterized by a patched and heterogeneous spatio-temporal pattern mainly due to the air transportation network identified as the major channel of epidemic diffusion and ability to connect far apart regions in a short time period. The SARS maps are obtained with a data-driven stochastic computational model aimed at the study of the SARS epidemic pattern and analysis of the accuracy of the model's predictions. Simulation results describe a spatio-temporal evolution of the disease (color coded countries) in agreement with the historical data. Analysis on the robustness of the model's forecasts leads to the emergence and identification of epidemic pathways as the most probable routes of propagation of the disease. Only few preferential channels are selected (arrows; width indicates the probability of propagation along that path) out of the huge number of possible paths the infection could take by following the complex nature of airline connections (light grey, source: IATA).
North Atlantic Ocean
North Pacific Ocean
Indian Ocean
South Pacific Ocean
South Atlantic Ocean
Virus path probability



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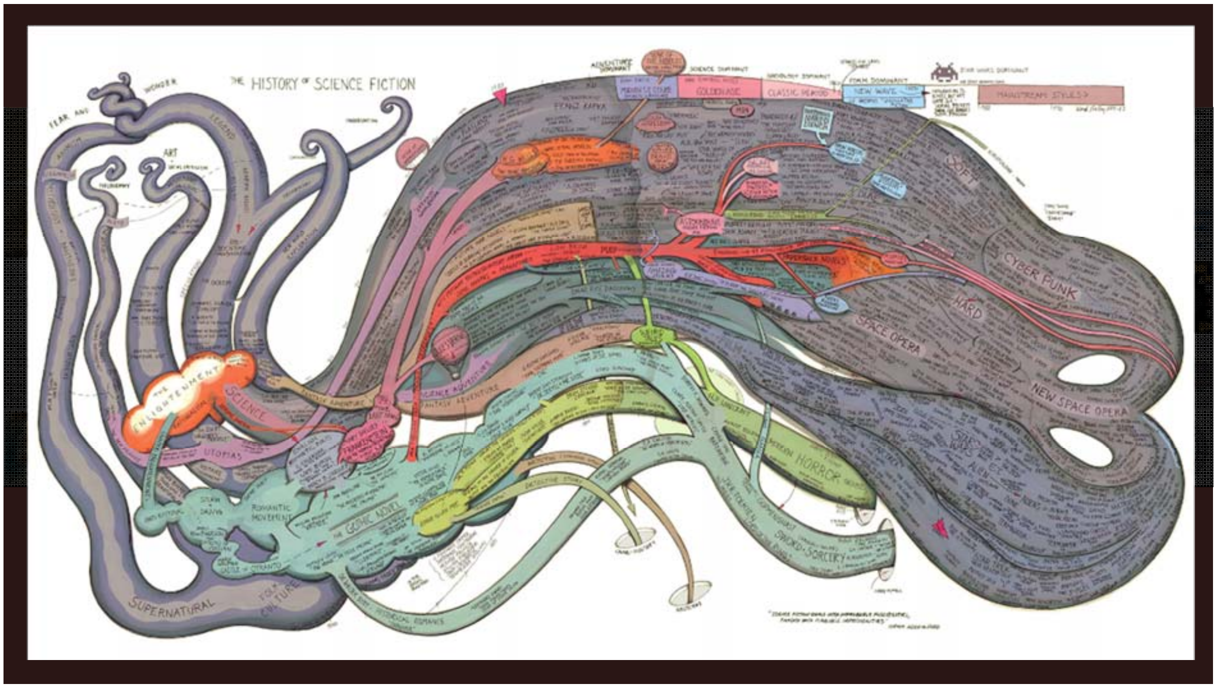
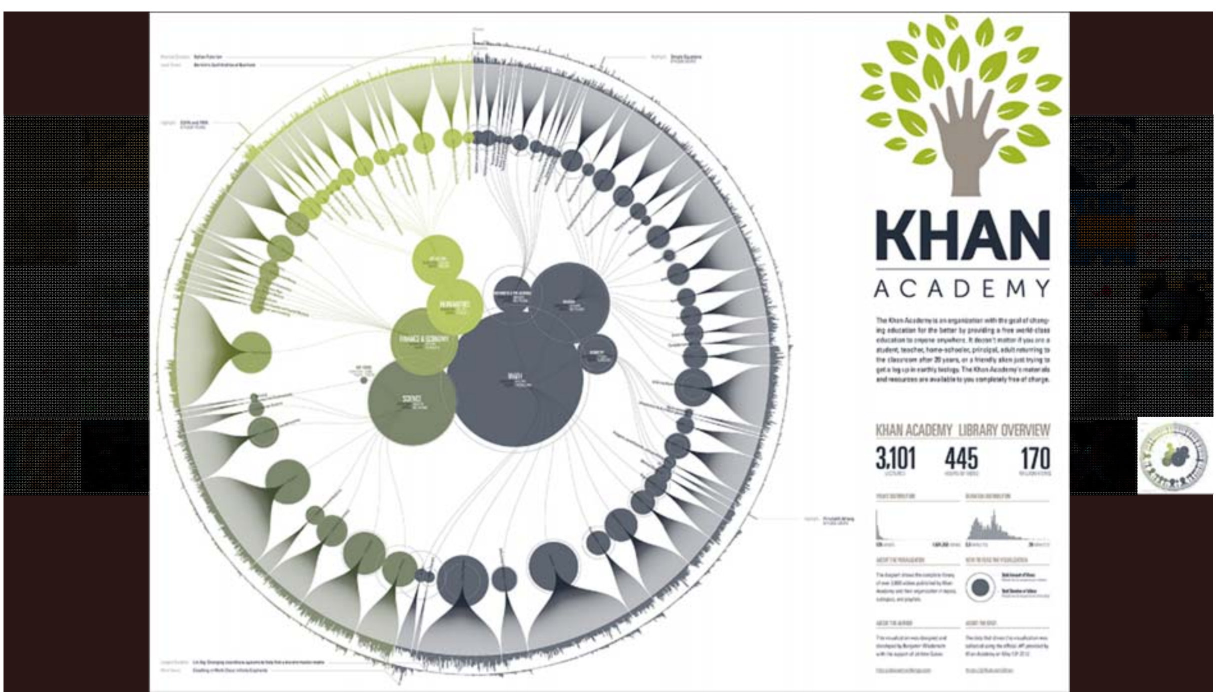

THE HISTORY OF SCIENCE FICTION
FEAR AND
WONDER
ENLIGHTENMENT
SCIENCE
UTOPIAS
ROMANTIC MOVEMENT
GOTHIC NOVEL
SUPERNATURAL
FOLK CULTURE
HORROR
SWORD & SORCERY
SPACE OPERA
NEW SPACE OPERA
CYBER PUNK
HARD
SOFT
GOLDEN AGE
CLASSIC PERIOD
NEW WAVE
MAINSTREAM STYLES ?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ACADEMY
MATH
SCIENCE
FINANCE & ECONOMY
KHAN ACADEMY LIBRARY OVERVIEW
3.101
445
170

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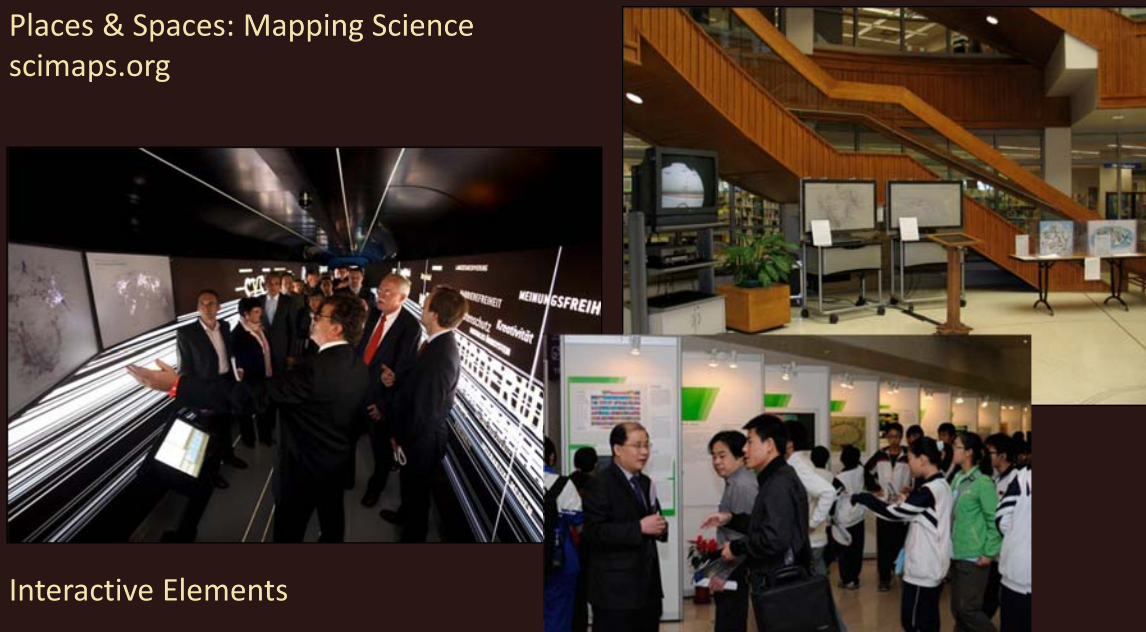

Interactive Elements

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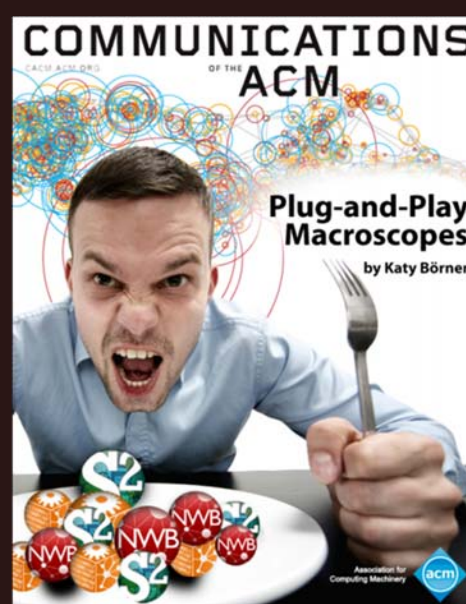
Anyone Can Cook

&

Anyone Can Map

Plug-and-Play Macroscopes
cishell.org



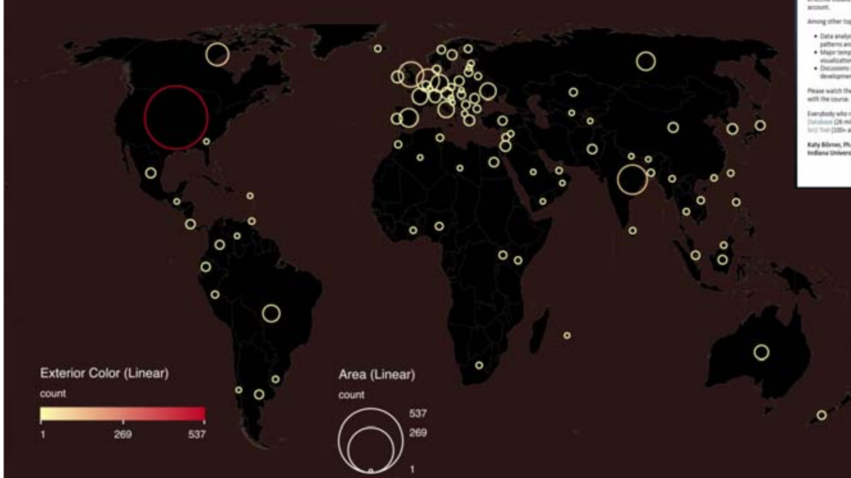
When? *Temporal*

Where? *Geospatial*

What? *Topical*

With Whom? *Network Analysis*

The Information Visualization MOOC
ivmooc.cns.iu.edu



Students come from
93 countries
300+ faculty members

#ivmooc

Have Fun With Maps and Macroscopes!

Share Data
Share Code
Share Tutorials
Share Insights

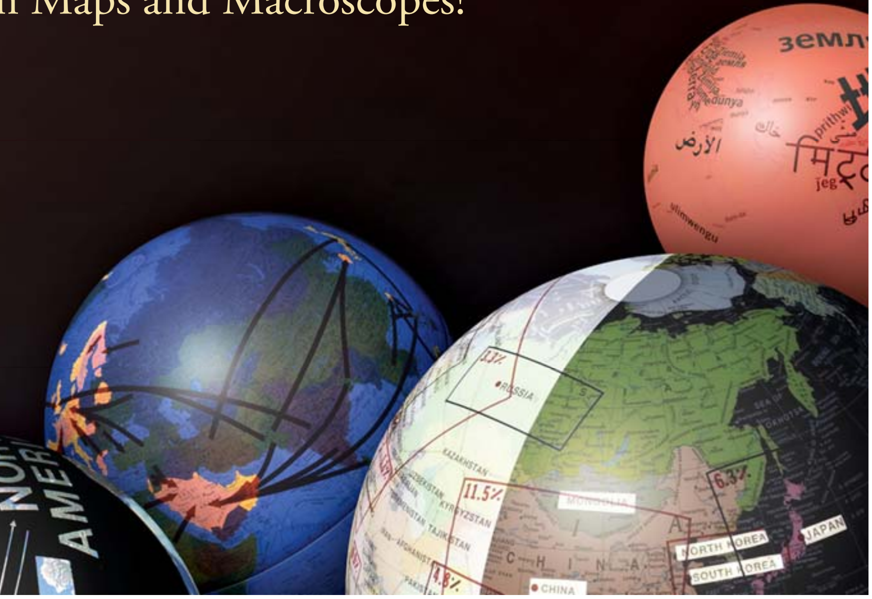


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Photo of Carlo Ratti by Lars Krüger www.lumivere.com