Mapping Software

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Mapping is on the march

• Cartography maybe dead.....
• But popular explosion in all kinds of mapping, availability of maps and potential participation in mapmaking
Mapping is on the march

• I’m a geographer, so I believe maps enjoy a privileged position in understanding space
• maps have been powerful visual tools for understanding the world for 1000s of years
• navigation - ‘what is where’ and ‘how to get there’
• revealing what is hidden. making the invisible visible
• maps have been key in framing our understanding places, their size, shape and the relations between them
• Claiming ownership of space. Maps creating space...

The map is a help provided to the imagination through the eyes.
Henri Abraham Chatelain, Atlas Historique (1705)
Mapping revolution in real space, but for navigating cyberspace?
Challenges in mapping cyberspace

• Socio-technical issue in surveying
  - scale, complexity, heterogeneity, dynamic (growing, changing)
  - the conflation of maps and territory; breaking the Euclidean norms of material space (continuity, symmetrical, location is indivisible),
  - private/public, ‘dark web’, copyright control, ethics of invasive monitoring / tracking

• Meaningful classification / categorisation - do we know what we are looking for?

• Appropriate metaphors that communicate rather than confuse. What should a map of cyberspace look like........??
Spatialization - making info maps

- Interfaces and map-like tools for virtual navigation
- Wide variety of ‘experiments’, some products (late 1990s, early 2000s)
  - visual metaphors (cartographic, cities, charts, organic)
  - dimensions (2D, 2.5D, 3D fly-thru)
  - static map to dynamically generated ‘radar’ displays
  - degrees of user interactivity

- Scales of the maps
  - individual site maps
  - dynamic surf maps / trail maps / history visualization
  - large chunks of information space

- Most popular mapping efforts have deployed graphs
Graphs don’t seem to communicate

- Popular - easy for designers to implement, algorithms can handle very large data sets
- Failure of graphs as mapping. Can denote data but often don’t connote real meaning to the viewer
Graphs don’t seem to communicate

complexity = confusion

T.S. Elliot, The Rock (1934)
Spatialization - making info maps

- Focus on interactive 2d space-filling information maps. Distinctly cartographic in connotation
Spatialization - making info maps

- Broadly two types:
  1. Cadastral mapping style -
     - discrete tiling of area by categories
     - defining property, implies ownership

  2. Landscape mapping metaphor -
     - continuous space, smooth transition
     - notion of terrain height denotes volume
     - shape conveyed by hill shading and/or contouring
     - terrain forms are indicative of underlying process (geomorphology in geographic landscapes)
Cadastral metaphor

- Treemaps algorithm, hierarchical tiling, space filing; intuitive meaning to size
- Ben Shneiderman, CS, UMD
Netscan project by Marc Smith, MSR
Cadastral mapping of conversation on Usenet
<table>
<thead>
<tr>
<th>Newsgroup Name</th>
<th>Date</th>
<th>Total Groups</th>
<th>Total Messages</th>
<th>Total Posters</th>
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<tbody>
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<td>alt.music</td>
<td>01/01/2001</td>
<td>807</td>
<td>197736</td>
<td>43757</td>
</tr>
</tbody>
</table>

**Deep red means - 300% change**

**Deep green means + 300% change**
On Labor Day, jobs debate a convention warm-up

US to ramp up pressure on Iran to avoid war: report

Peshawar suicide bomber kills two in attack on US vehicle

UN envoy: Diplomatic attempts to end Syrian conflict are 'nearly impossible'

Gaza teenager dies after self-immolation

UN Syria Envoy Recognizes 'Very Difficult Mission'

Clinton to seek China sea unity in Indonesia

Hungary Taking Heat for Extraditing Azeri Convict

US to ramp up pressure on Iran to avoid war: report

Paralympics 2012: Oscar Pistorius apologises for timing of criticism

Berbatov 'lost respect' for Fergie

Nicole watches with horror as Lewis Hamilton crashes out of Belgium F1

Russell Crowe Rescued By Coastguard

Peshawar suicide bomber kills two in attack on US vehicle

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A brain pain map to tell why we feel discomfort

Scientists are working on a way of measuring the level and location of pain felt by patients using a special "pain map" of the brain. The research, which utilises detailed brain scanning technology, could also finally put an end to the age-old...
Zooming into the Middle East
Landscape metaphor

- Clustering, Self-Organising algorithms
- Detail categories lost; does terrain work?
- Labelling issues for clusters
Andre Skupin SOM of Last.fm music
Why mapping cyberspace failed?

- Implementation - maps not workable
- Did not find the right metaphors, designs
- Political economy - fragmentation of info spaces
- Un representable?
But wait, what about ‘New Aesthetics’?

• Claimed to be radical ways of seeing the world that can only arise from computation vision. Space seen through coded eyes (sensors, logs, screens)

• Art that arises as “acknowledgment of computers as weird artifacts that have taken on lives of their own”, it speaks to “what is means to live in the twenty-first century” (Ian Bogost, The Atlantic)
But wait, what about ‘New Aesthetics’?

According to commentary by cyber-guru Bruce Sterling, “New Aesthetic is telling the truth. There truly are many forms of imagery nowadays that are modern, and unique to this period. We’re surround by machineries generating heaps of raw graphic novelty.”
Will ‘New Aesthetics’ succeed?

- Art - fragmentary and fripperies
- Typical of superficiality of social ‘scrap-booking’ of virtual ephemera. Sample of digital exhaust that pervades our living
- Needs to be political. Properly documenting all this pollution; not just ‘what’ but ‘why’
- A more critical mapping of software space
Mapping Software Space

- What needed now is focus of mapping effort not on the content but its **context**; seeing computational **infrastructures**, not information alone
- See the algorithmic pinch-points and databases that structure our experience of information and everyday mobility
- But what should / can be surveyed?, metaphors to communicate meaning of code be devised?
- ‘Software studies’, not computer science
Mapping Software Space

- Automatic production of space, emergent properties of software
- Code exhibits secondary agency
- Software sorting of people and places
- Documenting code/space
- Mapping full coded ecosystems (objects, infrastructures, processes, assemblages)
Mapping Software Space

• We use a smartphone on a daily basis for work and leisure, becoming intimately familiar with its materiality but how much do we know of the software running on it?

• Annette Schindler noted in 2003 “you think you know your computer, but really all you know is a surface on your screen.”

• Many stories of apps ‘leaking’ data, like geographic position, point clearly covert living of code
Mapping Software Space

• Map of your smartphone as a code/space
  - How is it observing you and mapping your movement
  - Relations surrounding the phone/person (cooperation, flirts, deals, lies, crimes); phone-phone associations
  - Risks in the code and connections (virus, trojans)
  - Pathways through hertzian space
  - Hidden contexts: carbon footprints, toxic inputs, disposal; unseen labour exploitation in the phone factories

• Can such maps of code/space be made?
• Will they have a political effect of changing of view of software and its role in our lives?
www.kitchin.org/atlas
www.cybergeography.org/codespace/

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Sources:

• Slide 2
  - http://www.guardian.co.uk/technology/2012/aug/28/google-apple-digital-mapping
  - http://www.bl.uk/magnificentmaps/
  - Mind the Map exhibition,
  - http://www.ltmuseum.co.uk/whats-on/exhibitions

• Slide 7
  - http://www.touchgraph.com/navigator
  - http://www.cs.ubc.ca/~tmn/
  - http://www.visualcomplexity.com/vc/

• Slide 8
• Slide 11
  - http://www.cs.umd.edu/~ben/

• Slide 12
  - http://www.connectedaction.net/marc-smith/

• Slide 14
  - http://marumushi.com/projects/newsmap

• Slide 18
  - Andre Skupin,
    - http://geography.sdsu.edu/People/Pages/skupin/index.htm

• Slide 20
    - http://new-aesthetic.tumblr.com/

• Slide 21
  - http://www.wired.com/beyond_the_beyond/2012/04/an-essay-on-the-new-aesthetic/