Translating Data into Images

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Transforming, Projecting, Translating
transform (transformer)
verb [with object]

1 make a marked change in the form, nature, or appearance of: lasers have transformed cardiac surgery | he wanted to transform himself into a successful businessman.

2 Mathematics change (a mathematical entity) by transformation.

Neurath, Marie, and Robin Kinross. 2009.
project (projeter)
verb | prəˈjekt | [with object]

1 estimate or forecast (something) on the basis of present trends: spending was projected at $72 million.

2 [no object] extend outward beyond something else; protrude: I noticed a slip of paper projecting from the book | (as adjective projecting): a projecting bay window.

3 throw or cause to move forward or outward: seeds are projected from the tree.

4 present or promote (a particular view or image): he strives to project an image of youth.

5 Geometry draw straight lines from a center of or parallel lines through every point of (a given figure) to produce a corresponding figure on a surface or a line by intersecting the surface.

6 make a projection of (the earth, sky, etc.) on a plane surface.

Lévy, Jacques, and Michel Lussault, eds. 2013.
translate (traduire)
verb [with object]

1 express the sense of (words or text) in another language: several of his books were translated into English.

2 move from one place or condition to another: she had been translated from familiar surroundings to a foreign court.

3 Physics cause (a body) to move so that all its parts travel in the same direction, without rotation or change of shape.

Affinity Map

the case study
The Affinity Map is a visual representation of ENAC. ENAC is the school of building constructions that gathers Architecture, Civil and Environmental Engineering. The ENAC is composed by three institutes, seventy laboratories and a thousand of scholars.
Personal view of Marilyne Andersen of ENAC
Representing Academic Practice

the exercise, the thesis
Academic Practice

Many activities
Different according to discipline
Not only literature
Collaboration

A component of academic practice
Multidimensional (writing, teaching, etc.)
Multi-scale (scholars, laboratories, etc.)
Affinity

A way to describe the academic practice

Intellectual and operational closeness between individuals

Actual and potential
Visualization

Academic practice is mostly hidden
It can be made visible
It can be made visible using affinities
Questions about Representing Academic Practice

Which data describes the academic practice?

How to translate these data?

Is there an ethics of scholar representation?
Data Investigation

*embrace all of the different practices*
<table>
<thead>
<tr>
<th>Indicators</th>
<th>Primary source</th>
<th>Secondary source</th>
<th>To be specially required in online labs’ activity report?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus topics (thematics)</td>
<td>Symphony database</td>
<td>Lab’s websites (research)</td>
<td>Maybe (would be nice to have the user confirming existing data from Symphony/lab’s website for instance)</td>
</tr>
<tr>
<td>Keywords</td>
<td>Lab’s websites (metadata &quot;keywords&quot;, from audit 2011)</td>
<td>Idem</td>
<td>Idem</td>
</tr>
<tr>
<td>Expertise areas</td>
<td>Symphony database</td>
<td>lab’s websites (expertise box)</td>
<td>Idem</td>
</tr>
<tr>
<td>Publications keywords and contents/abstract</td>
<td>Infoscience</td>
<td>Idem</td>
<td>Idem</td>
</tr>
<tr>
<td>Publications co-authors and their institutions</td>
<td>Infoscience (but institutions may be abbreviated variously...)</td>
<td>People’s publication page</td>
<td>No</td>
</tr>
<tr>
<td>Alumni a3 (activity sector, localization)</td>
<td>Alumni database (with probable confidentiality issues?)</td>
<td>Idem</td>
<td>Idem</td>
</tr>
<tr>
<td>Co-teaching</td>
<td>IS-Academia</td>
<td>People’s teaching page</td>
<td>Yes (should be structured in an easy way for being extracted)</td>
</tr>
<tr>
<td>Industrial partners</td>
<td>Audit 2011 or lab’s annual reports (extract from &quot;valorization, collaboration &amp; network&quot;)</td>
<td>Lab’s annual reports</td>
<td>Yes (proposing a selectable list?)</td>
</tr>
<tr>
<td>Main funding organizations</td>
<td>EPFL Grants database (maybe not possible?)</td>
<td>Audit 2011 or lab’s annual reports</td>
<td>Yes (proposing a selectable list, if possible?)</td>
</tr>
<tr>
<td>Link to flagship projects</td>
<td>Idem</td>
<td>Idem</td>
<td>Idem</td>
</tr>
<tr>
<td>People &amp; Team</td>
<td>People’s pages (Expertise+Biography&amp;Work+Teaching)</td>
<td>News flux</td>
<td>Maybe</td>
</tr>
</tbody>
</table>

Note: There are two different choices available. You may propose another one, since they consider it as flagship.
<table>
<thead>
<tr>
<th>Information</th>
<th>Affinity type</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab thematics</td>
<td>Potential</td>
<td>Symphony</td>
</tr>
<tr>
<td>Lab thematics</td>
<td>Potential</td>
<td>EPFL website</td>
</tr>
<tr>
<td>Individual expertise</td>
<td>Potential</td>
<td>Symphony</td>
</tr>
<tr>
<td>Individual expertise</td>
<td>Potential</td>
<td>EPFL website</td>
</tr>
<tr>
<td>Keywords</td>
<td>Potential</td>
<td>Audit 2011</td>
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<tr>
<td>Keywords</td>
<td>Potential</td>
<td>Infoscience</td>
</tr>
<tr>
<td>Co-authoring</td>
<td>Actual</td>
<td>Infoscience</td>
</tr>
<tr>
<td>Co-teaching</td>
<td>Actual</td>
<td>IS-Academia</td>
</tr>
<tr>
<td>Co-advising</td>
<td>Actual</td>
<td>IS-Academia</td>
</tr>
<tr>
<td>Grants</td>
<td>Actual</td>
<td>Grant database</td>
</tr>
<tr>
<td>Industrial partners</td>
<td>Actual</td>
<td>Audit 2011</td>
</tr>
</tbody>
</table>

*Table of digital traces, the strikethrough identifies not usable data.*
The *structure of the school* was used to reassemble laboratories and institutes. In particular, the personal ID (SCIPER), the affiliations of the staff and the hierarchical structure of the EPFL.

We identifies three types of *actual affinities*: the publications stored in the *Infoscience system*, the courses and the supervision recorded in *IS-Academia*.

*Potential affinities* were generated as *keywords* through an algorithm of text mining working on the publication abstracts of the ENAC laboratories.
Visual Investigation

drawing laboratories
Hexagonal Network Visualization

size, isolement, continuity
Education (Supervision and Courses)
“Design is the conscious and intuitive effort to impose meaningful order. [...] Our delight in the order we find in frost flowers on a window pane, in the hexagonal perfection of a honeycomb, in leaves, or in the architecture of a rose, reflects man’s preoccupation with pattern.”

Pre and post Harry Beck’s London underground map.
“Regular graphs are unique in that each node has exactly the same number of links. Indeed, in a two-dimensional mesh of perpendicular lines forming a simple square lattice each node has exactly four links, or in a hexagonal lattice of a beehive each node is connected to exactly three others [links].”
Back to Individual

the whole is different than the sum of its parts
Making individuals and affinities visible together.
Making individuals and affinities visible together.
Satellites

intermediary connectivity level
“Visual Information-Seeking Mantra: overview first, zoom and filter, then details on demand.”

Shneiderman, Ben. 1996. The Eyes Have It: a Task by Data Type Taxonomy for Information Visualizations.
Intermediary level: Meso
“In this awesome journey to the ends of the universe, you have learned an immense amount about its structure and the beings and things that occupy it, and above all about the relationships of things to each other, in their various scales of dimension, with a vividness that words cannot express.”

Boeke, Kees. 1957. Cosmic View.
“Micro and macro [...] are really two faces of the same thing”

- Ego network
- Multidimensional
- Proportional distance
- Position quality
- Improve overlapping
Semantic Background

defining potential affinities
“In information retrieval, tf–idf or TFIDF, short for term frequency–inverse document frequency, is a numerical statistic that is intended to reflect how important a word is to a document in a collection or corpus.”

— Wikipedia 2018
Network visualization of 400 publications
Characteristics

- Use of hexagonal grid
- Justification of closeness
- Semantic layer on links
- Color meaning

Keywords as potential affinities.
Collaboration and Lexical distance
Walkable Visualization
Conclusions
Process of design
Reduction and amplification
Collage
New visual grammars
Readers want to see their one self
Ethics
Threshold of privacy
Assembling individuals
Thanks