Chapter I
Introduction to Graphic Semiology

1.1 – Introduction
1.2 – Static Cartography
1.3 – Dynamic and Interactive Cartography
1.4 – Subjective Aspects of colors
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1.6 – Cartograms
1.7 – Chorems
1.8 – How to Lie with Maps
1.9 – Conclusions

Tendermap by Mlle de Scudéry

Nebamon Garden Thebes, 14th BC
1. 1 – Introduction

- Semiology: Study of meaning
- Graphic Semiology:
  - Meaning of drawings
  - Choice of captions, symbols and icons
  - Methodology to transmit a visual message


- “A picture is worth 1000 words”

Methodology

- Analysis of the message to be transmitted
- Selection of the medium
- Selection of icons, symbols
- Structuring corporate design/identity
- Psycho-technical Tests

Applications

- Highway Code
- Commercial messages
- Newspaper layout
- Corporate identity
- Mapping
- Statistical summaries
- GUI design
- Etc.
Animated Graphic Semiology

- Movement
  - ex: linear phenomenon
- Flickering
- Mutation
- Replacement
- Gradual modification
  - ex: gradual modification of a shape
  - ex: slow modification of colors
- Velocity
  - Adapted to the size, to the contrast and duration of the phenomenon.

Information to be transmitted

- Différential information: a list of objects, of production goods, of countries, etc.
- Ranked information: geological layers, chronological order, etc.
- Quantitative information: measures, proportions, etc.

Iconic symbols

Bertin

Visual Variables

<table>
<thead>
<tr>
<th>Shape</th>
<th>Size</th>
<th>Orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pattern (texture)</th>
<th>Hue (colour)</th>
<th>Hue value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Bertin's visual variables

**Map legend**

- Size variation allows the representation of quantitative variations
Shapes

- Shapes represent object identities
  - Pictograms
  - Basic shapes (square, circle, etc.)

- Readability often better than realistic drawings

Hue values

- Variation of color value is a variation of luminous intensity; allows ordered relations (quantitative relations)

Colors

- May represent differences, but there are cultural and psychological connotations.

- ➔ non-ordered differences

Patterns

- Patterns may represent several variables (shape, size) through ordered relations and relative quantitative differences
Orientation

- Allows the positioning vis-à-vis axes

1.2 Static Cartography

- Common Cartography
  - Necessity of a scale
    - What about scale 1?
  - Necessity of coding, captions, simplifications, etc.
  - But what is exactly a map?

Examples
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A constructed model implying
- down-scaling
- selection
- generalization

Is

An iconic, graphic model using signs
- visual
- auditory
- haptic
- etc.

A medium
- permanent (paper)
- temporary (screen)

Through

Specific goals
- present and transmit information
- provide localizations
- explore distributions
- reveal visible or non-visible relations
- exchange, participate

At

A given time together with a context
- historic
- social
- technical
- scientific

Choices
- scientific
- subjective
- empirical

What is a map?

What is a map?

Map

Pollution

Noise Visualization

http://www.uni-tuebingen.de/geo/ag-appel/projects/envmap/pollution/B27.jpg

http://www.uni-tuebingen.de/geo/ag-appel/projects/envmap/pollution/B27.jpg
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**Graphical representation**
- Isophons
- Proportional circles
- Proportional lines
- Colors and Textures
- Symbols
- Bubbles

**Type of Graphical Representations**

**Balloons with measures**

**Ballons with acoustic signals**
Example in Lyon

Generalization of geographic shapes
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3D Mapping

Risk
3D map
mpa.itc.it/corso.html

Other 3D examples

1.3 – Animated and Interactive Cartography

- With animation
  - modification of shapes
  - modification of colors
- What about extensions of graphic semiology?
Examples of animated maps

- Mont St Helen (Road map)
- Noise of a moped

Other examples

- Mont St Helen
- Road map

Active cartography

- User interaction
- Clickable maps
- Hypermaps

Examples:
- Mont St Helen: [Image]
- Noise of a moped: [Image]
- Road map: [Image]
- Active cartography features:
  - User interaction
  - Clickable maps
  - Hypermaps
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Principles of hypermaps

Points and active zones

http://www.meteo.fr
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Hypermap for risks in Genoa
http://www.provincia.genova.it/pdb/pdb03.htm

By clicking on a zone, one can get information about future landslides and floods.

1.4 – Subjective Aspects of colors

- Analysis of some common colors
- “Colored people”
**Red**

- Meaning
  - power, sex, interdiction, danger,
  - blood, warmth
  - Santa Claus
  - Good luck (Asia)

**Blue**

- Meaning
  - tranquility
  - authority, competence
  - nobility, blue blood (France)
  - immortality (Chine)

**Yellow**

- Meaning
  - youth
  - coward
  - advertising signal
  - construction
  - telephone directories
  - sun, light

**Green**

- Meaning
  - hope, harmony
  - nature, jealousy
  - money (USA)
  - ecology
  - give authorization
White

- Meaning
  - purity, innocence, cleanness
  - kingdom
  - rendition
  - official announcement (France)

Black

- Meaning
  - death
  - ill omen
  - Anarchy
  - tuxedo

Brown

- Meaning
  - solidness
  - neutrality
  - “bullshit”

Rose

- Meaning
  - innocence, fragility
  - woman
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Violet

- Meaning
  - authority (color officialis)
  - suffering
  - melancholy

1.5 – Color Matching

- Johannnes ITTEN’s Theory

Linking colors

Stars and Circles

http://www2.epson.fr/technologies/colorguide/COL_G/MAINMENU.HTM
Harmony of colors

Examples of shading

Hue Contrast
Complementary color contrast
Luminous Contrast
Chroma Contrast

Selection of colors
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Seven Contrasts

1. The contrast of complements: The contrast is formed by the juxtaposition of color wheel or perceptual opposites.

2. The contrast of analogous: The contrast is formed by the juxtaposition of colors that are adjacent on the color wheel.

3. The contrast of light and dark: The contrast is formed by the juxtaposition of light and dark values. This can be a monochromatic composition.

4. The contrast of light and shade: The contrast is formed by the juxtaposition of light and shade values. This can be a monochromatic composition.

5. The contrast of hue: The contrast is formed by the juxtaposition of different hues. The greater the distance between hues on the color wheel, the greater the contrast.

6. The contrast of intensity: The contrast is formed by the juxtaposition of color intensities. The greater the difference in intensity, the greater the contrast.

7. The contrast of saturation: The contrast is formed by the juxtaposition of color saturations. The greater the difference in saturation, the greater the contrast.

Proportion and Intensity

- Dominant color
- Sub-dominant colors
- Accent

- Dominant color
- Sub-dominant colors
- Accent

- Dominant color
- Sub-dominant colors
- Accent

- Dominant color
- Sub-dominant colors
- Accent
Bank notes in Euros

Cold and warm colors

Warm and cold colors

Examples of websites
http://www.worqx.com/color/learning2.htm
1.6 – Cartograms

- Maps not made according to areas, but distorted according to some parameters
- Distortion
  - Approximately same shape
  - Rectangles
  - Circles (Dorling)
Dorling cartogram

Comparison

1.7 – Chorems

- A chorem is a schematic representation transmitting meaning for a spatial phenomenon

- Generally visual representation

- Brunet’s Chorems
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Water problem in Brazil

- Conventional map
- Chorem map
- Caption

1.7 – How to Lie with Maps!

- Ill-chosen legend can yield erroneous decision-makers
- Voluntarily or non voluntarily
- Book "How to Lie with Maps!"
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Visual Information Systems

Pr. Robert Laurini
Selection of locations

Example of generalization

Examples of generalization

Caricature
Bad segmentation

1.9 – Conclusions (1/2)

- Importance of semiology
- Cartography
  - static
  - dynamic
  - interactive
- Importance of the message to be transmitted
- How to Lie?

Conclusion (2/2)

- Vision and shape understanding
- Vision and color understanding
- Cultural aspects
- Cognitive aspects