ΠΑΝΕΠΙΣΤΗΜΙΟ ΘΕΣΣΑΛΙΑΣ


# Thematic cartography

## **Session 3:** Generalization – Basic Concepts

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# Outline

- The concept of generalization
- Generalization - geometry
- Generalization - content

# The concept of generalization (1)

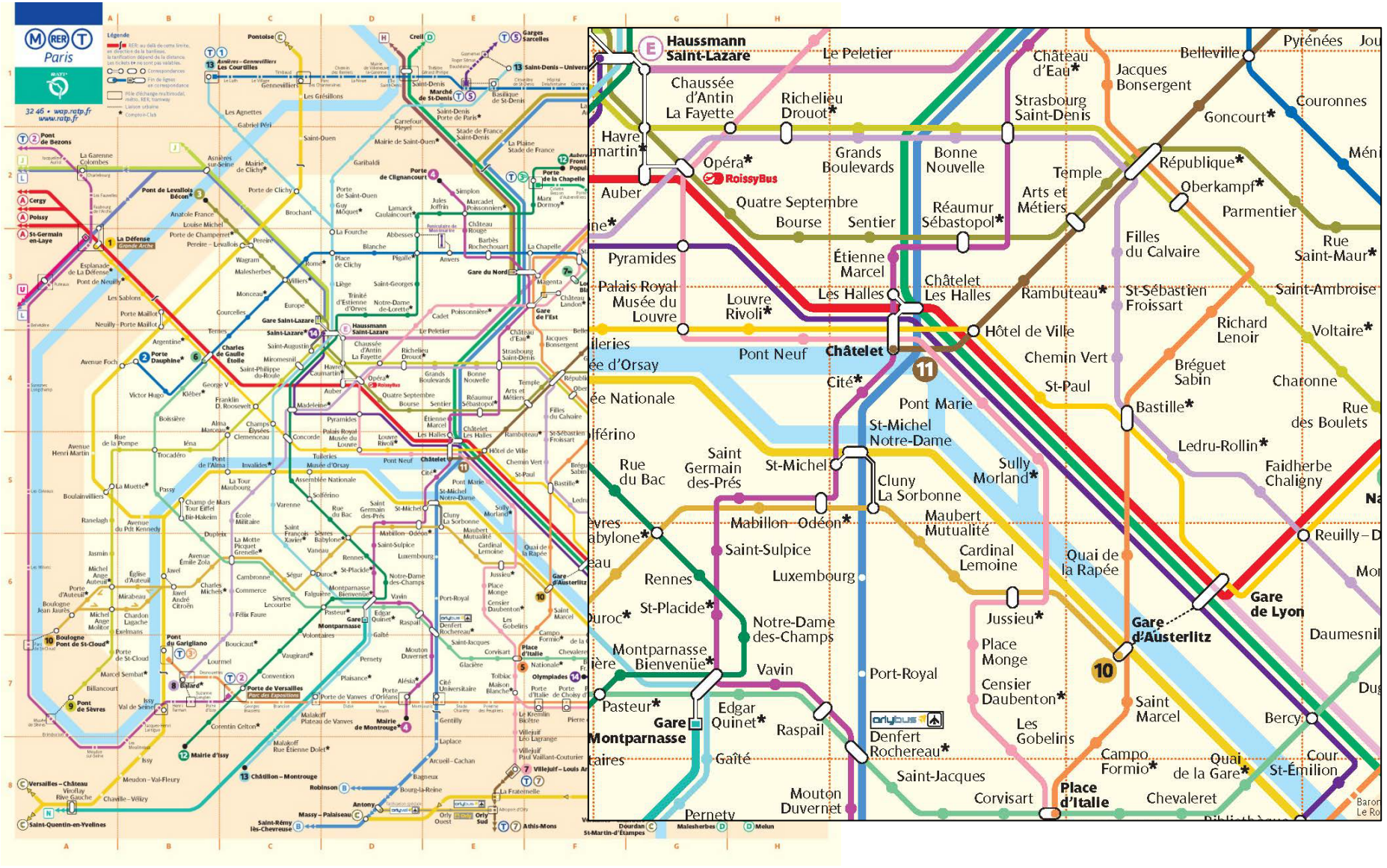
"The process of reducing the amount of detail in a map in a meaningful way is called generalization." (Kraak & Ormeling, 2010, pp. 95)

"Map generalization: Little White Lies and Lots of Them" (Monmonier, 1991; title of chapter 3)

"Generalization, Robinson suspected, would forever remain an intrinsically creative process and would thus escape the modern tendency towards standardization." (McMaster & Shea, 1992)

"... But the value of a map depends on how well its **generalized geometry** and **generalized content** reflect a chosen aspect of reality". (Monmonier, 1991, pp. 25; emphasis added)

# The concept of generalization (2)




**Source**: http://parisbytrain.com , last accessed 31/08/2015

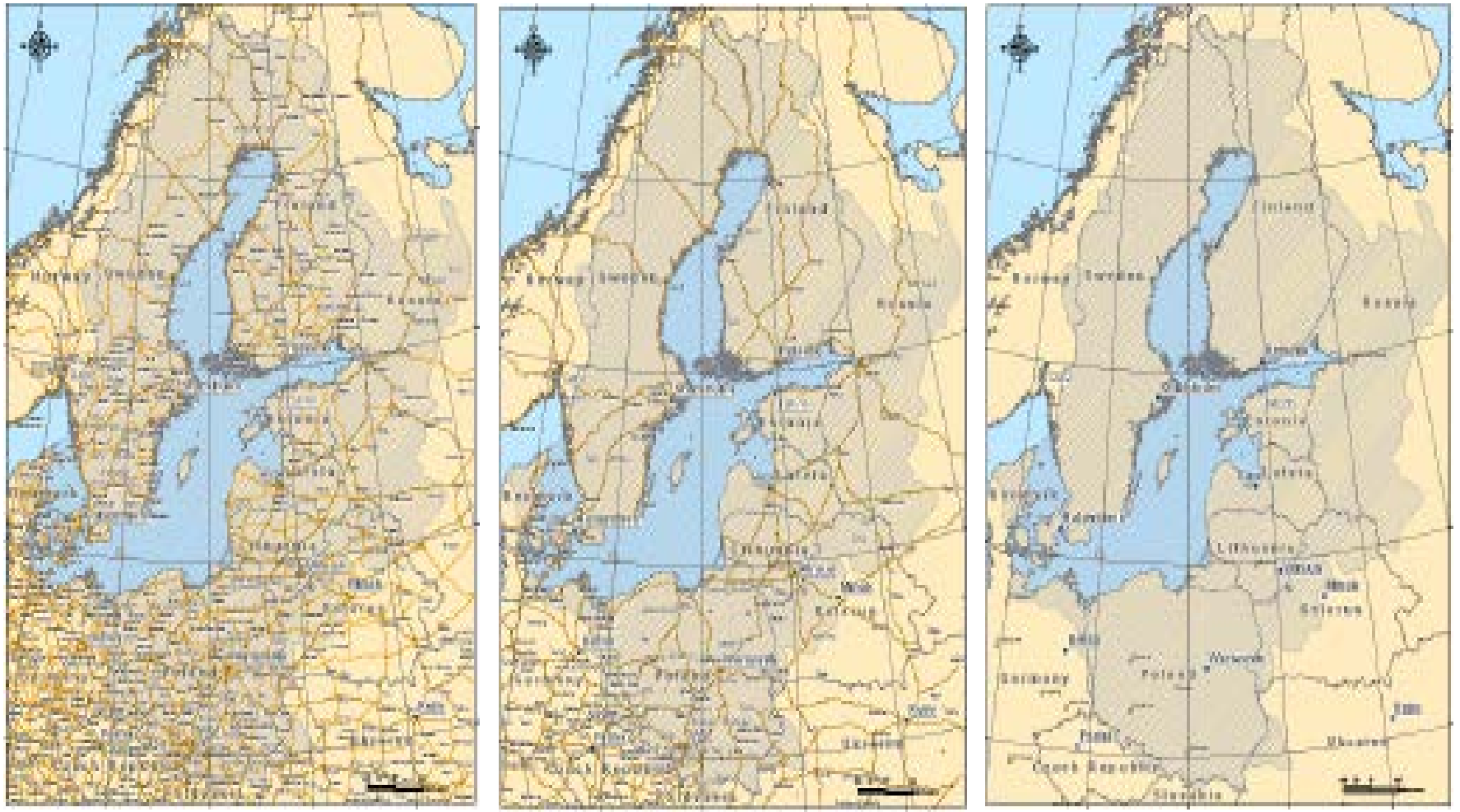
# Generalization - geometry (1)

Geometric generalization affects the objects on a map. It includes 5 main elementary operations: *selection*, *simplification*, *displacement*, *smoothing* and *enhancement (or exaggeration)*.

Additional operations or sub-operations can be indentified according to different features (e.g. aggregation – grouping point locations and representing them as areal objects or grouping several areal features into a larger element)

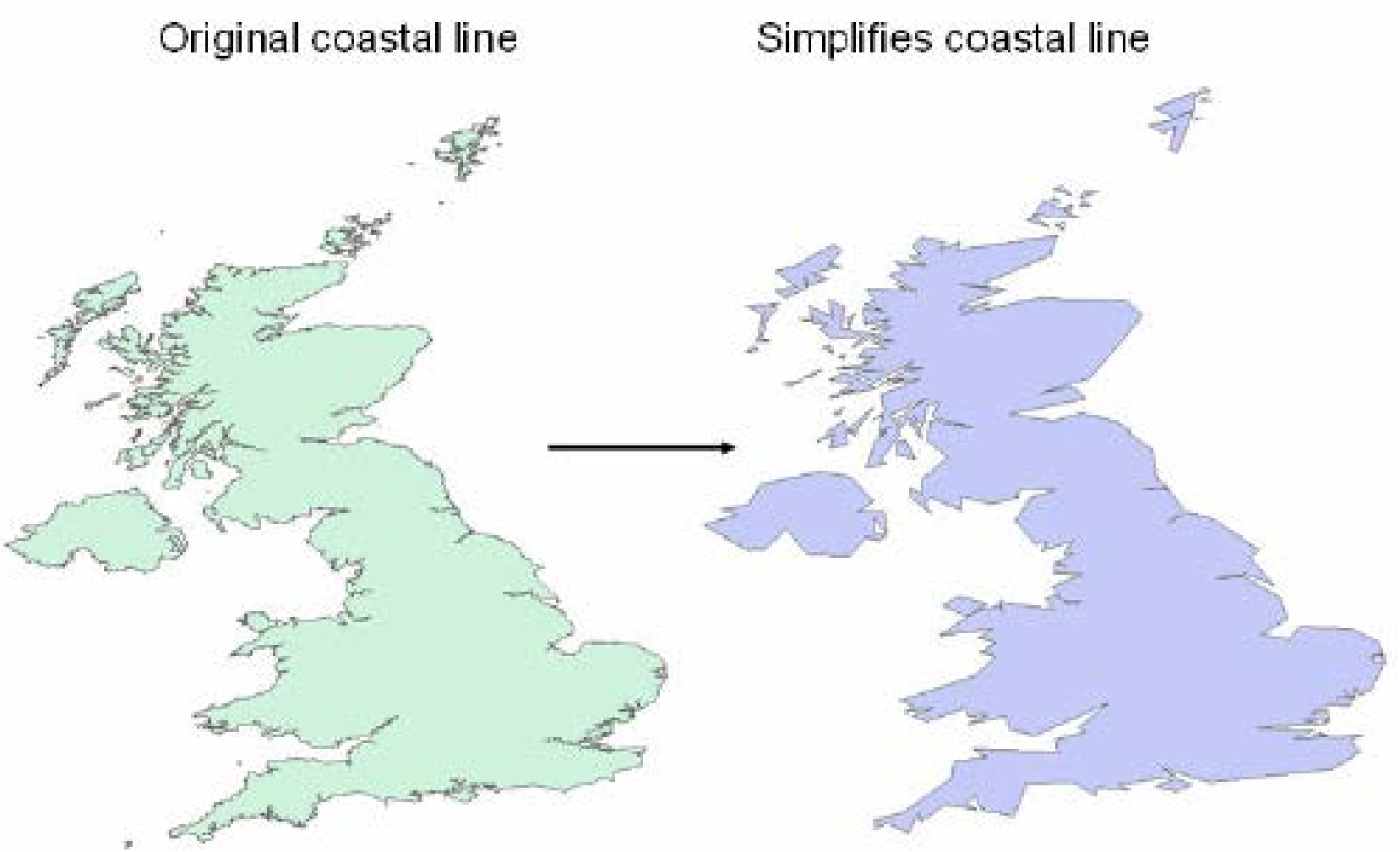
In certain cases, high degree of generalization (loss of accuracy) can have higher fitness **for function** by being a **less true** representation of reality e.g. in schematic maps.

# Generalization - selection



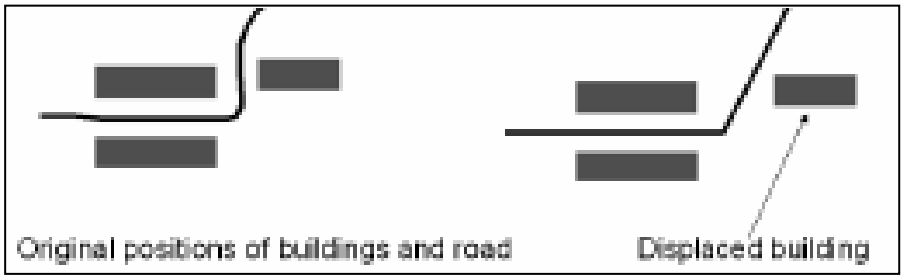
**Source**: Govorov (2008), © National Land Service under the Ministry of Agriculture, Vilnius, Lithuania
Available at: https://www.geoportal.lt/geoportal/documents/18923/19607/GII-06_training_material.pdf/09667d19-af2a-4903-b4b6-bf68643c999d

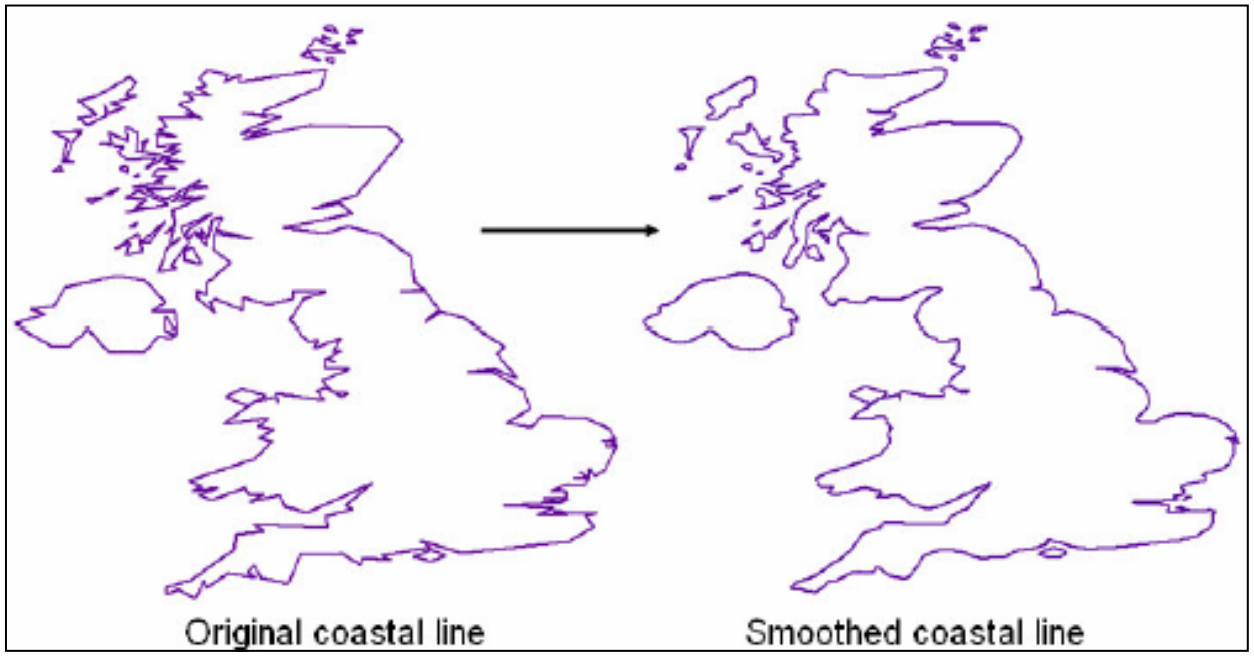
# Generalization - simplification




**Source**: Govorov (2008), © National Land Service under the Ministry of Agriculture, Vilnius, Lithuania
Available at: https://www.geoportal.lt/geoportal/documents/18923/19607/GII-06_training_material.pdf/09667d19-af2a-4903-b4b6-bf68643c999d

# Generalization – displacement & smoothing




**Source**: Govorov (2008), © National Land Service under the Ministry of Agriculture, Vilnius, Lithuania
Available at: https://www.geoportal.lt/geoportal/documents/18923/19607/GII-06_training_material.pdf/09667d19-af2a-4903-b4b6-bf68643c999d

# Generalization - Content

Content related generalization, also includes operations such as **simplification** (namely, to determine important attributes and eliminate unwanted detail) and **enhancement or exaggeration** (namely, to focus on specific attributes or corresponding characteristics).

But we can identify additional operations such as:

**Symbolisation** - use graphic symbols to encode information for visualisation (visual variables) and place them into a map, and

**Classification** - order, scale and group features by attributes

# Symbolisation - Symbols

Jaques Bertin (1974), describes as **marks (symbols)**:

**points** (dimensionless locations on the plane, represented by signs that obviously need to have some size, shape or color for visualization).

**lines** (that represent information with a certain length, but no area and therefore no width. Again lines are visualized by signs of some thickness)

**areas** (that have a length and a width and therefore a two-dimensional size.)

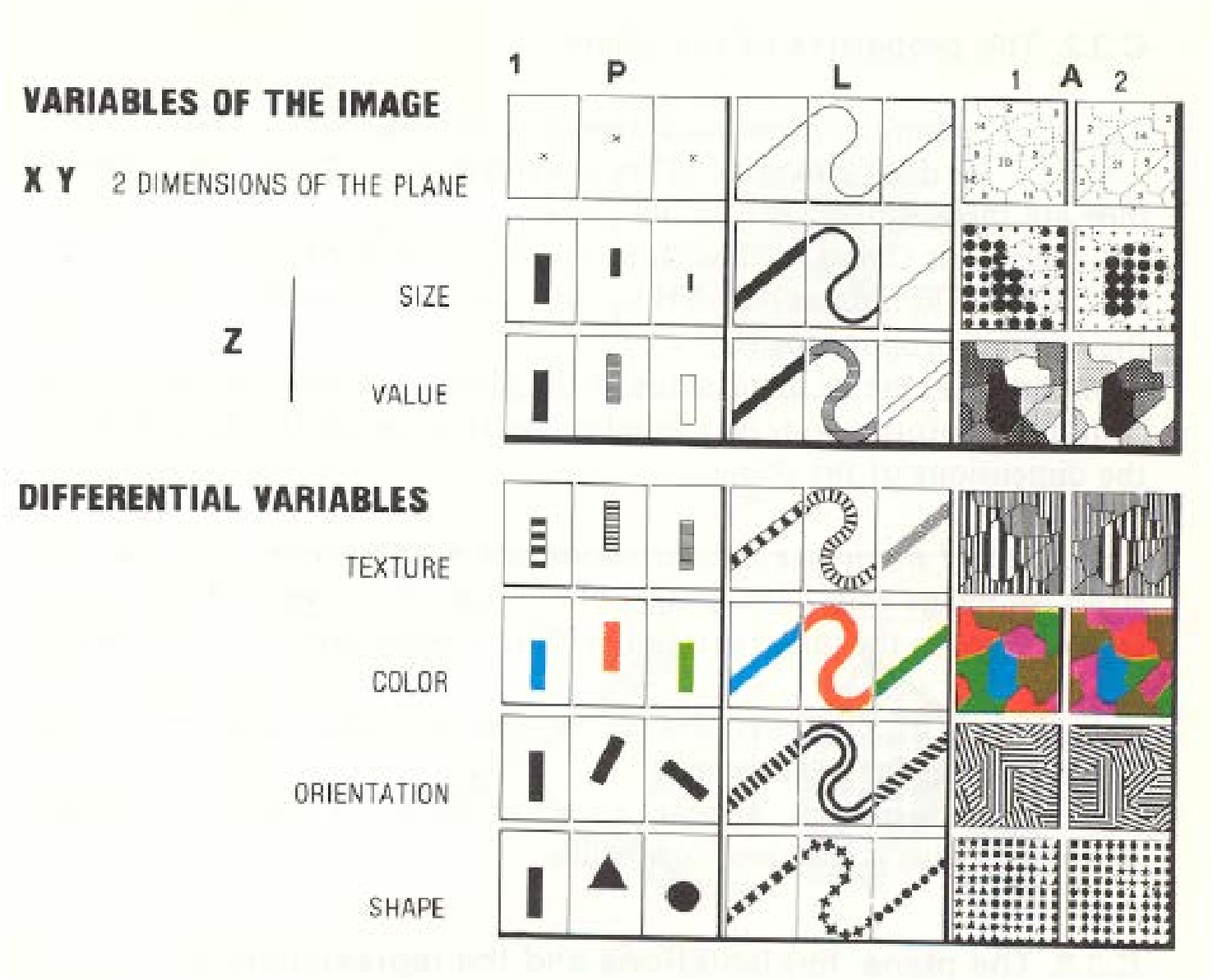
**surfaces** are areas in a three-dimensional space, but with no thickness.

**volumes** (have a length, a width and a depth. They are thus truly three-dimensional.)



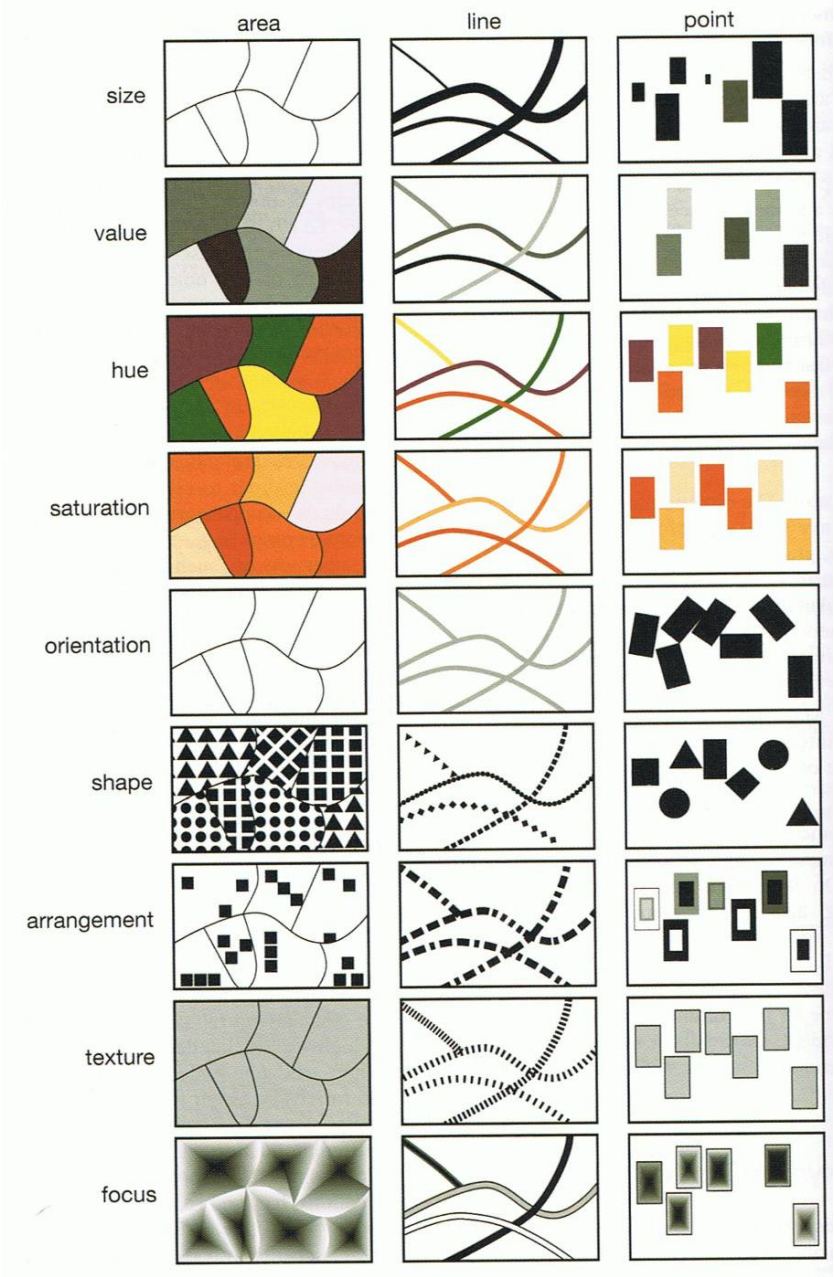
**Source**: http://www.infovis-wiki.net

# Symbolisation – visual variables (1)




**Source**: Bertin (1981)

# Symbolisation – visual variables (2)




**Source**: Bertin (1981)

# Symbolisation – visual variables (3)

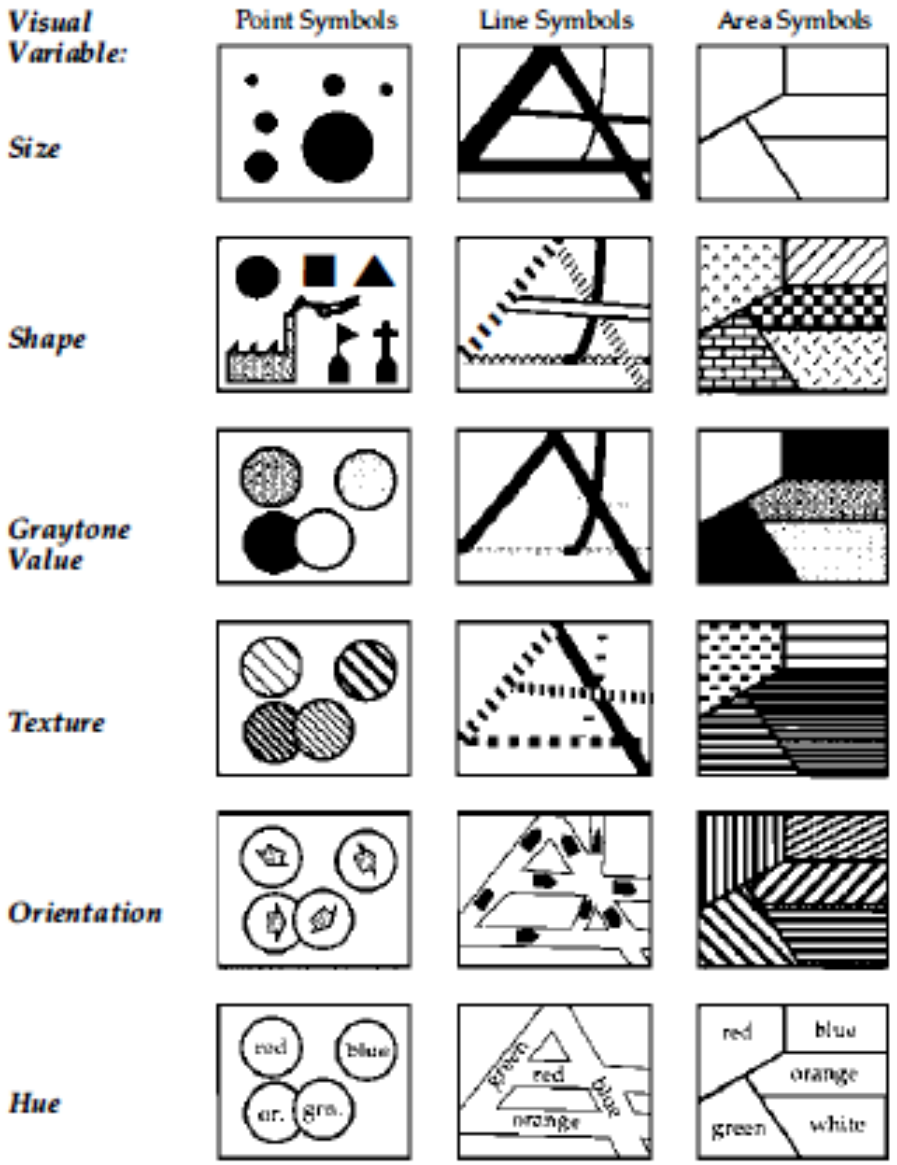



FIGURE 2.11. The six principal visual variables.

**Source**: Monmonier (1991)

# Classification

The objective of classification is to group (*classify*) features or data in such way that not only are the data/ features within a class similar but also the classes themselves are dissimilar.

Regarding thematic overlay, data classification…

"*In more technical terms, the goal is to find the optimal number of classes—and where to put the breaks between those classes—so as to minimize within-group variance and maximize between-group differences.*"

source: http://axismaps.github.io/thematic-cartography/articles/classification.html

We are going to discuss more for data classification and classification schemes during the next session.

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# End of session