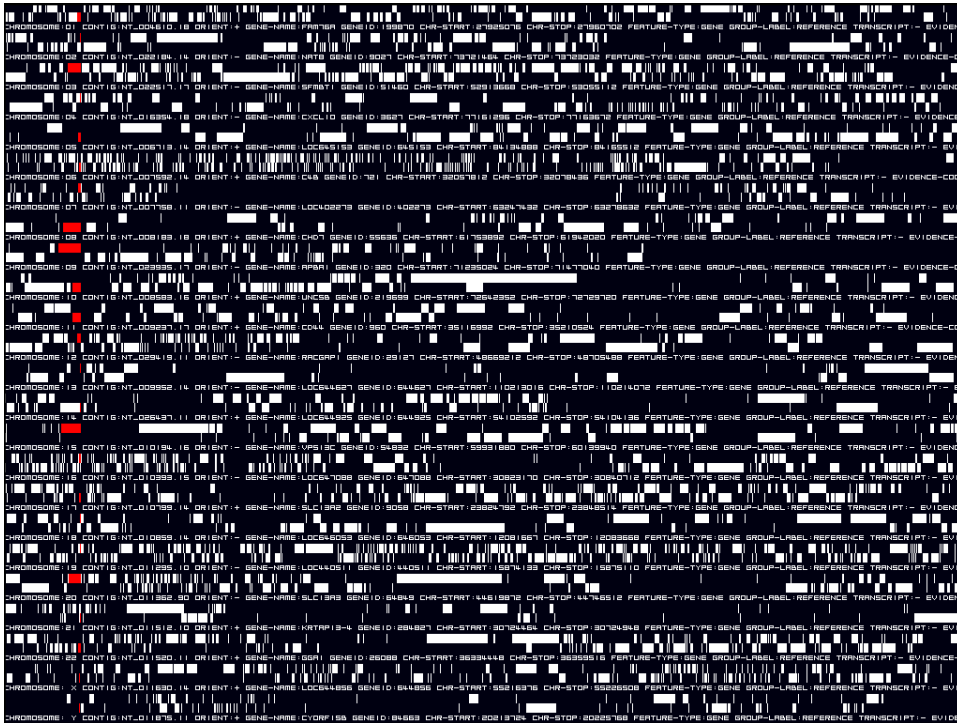


Design Basics



What is design?

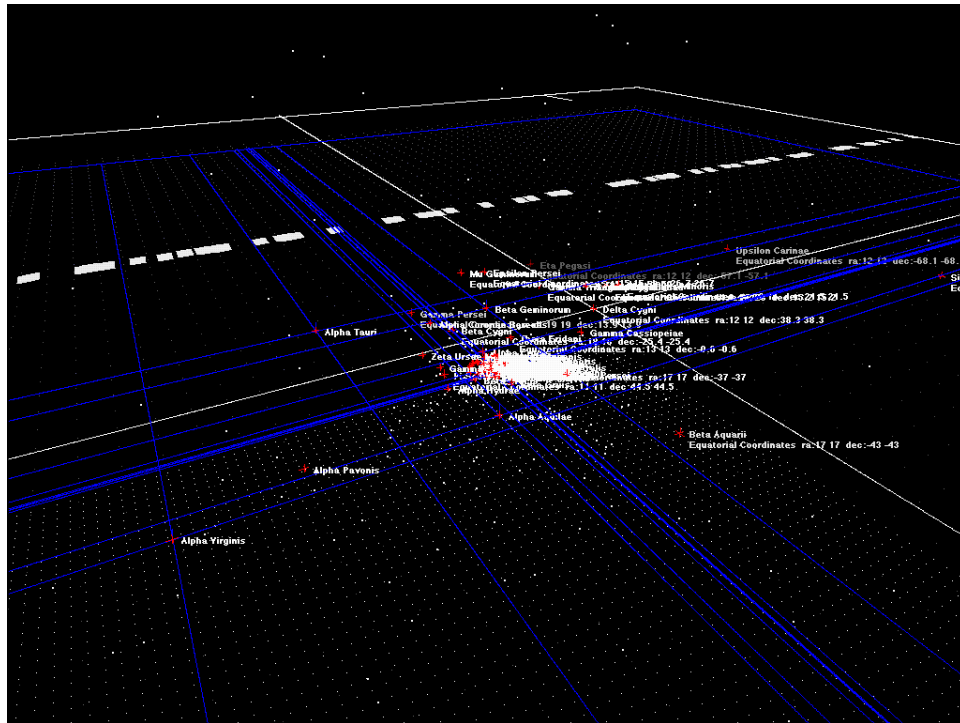
A plan and process for the construction of an object, space, image, etc.

- Purpose is to create clarity
- Like language and musical composition, the design of an object or image involves rules by which to structure information
- Process involves modeling – and iterative finetuning during the prototype phase

What is design?

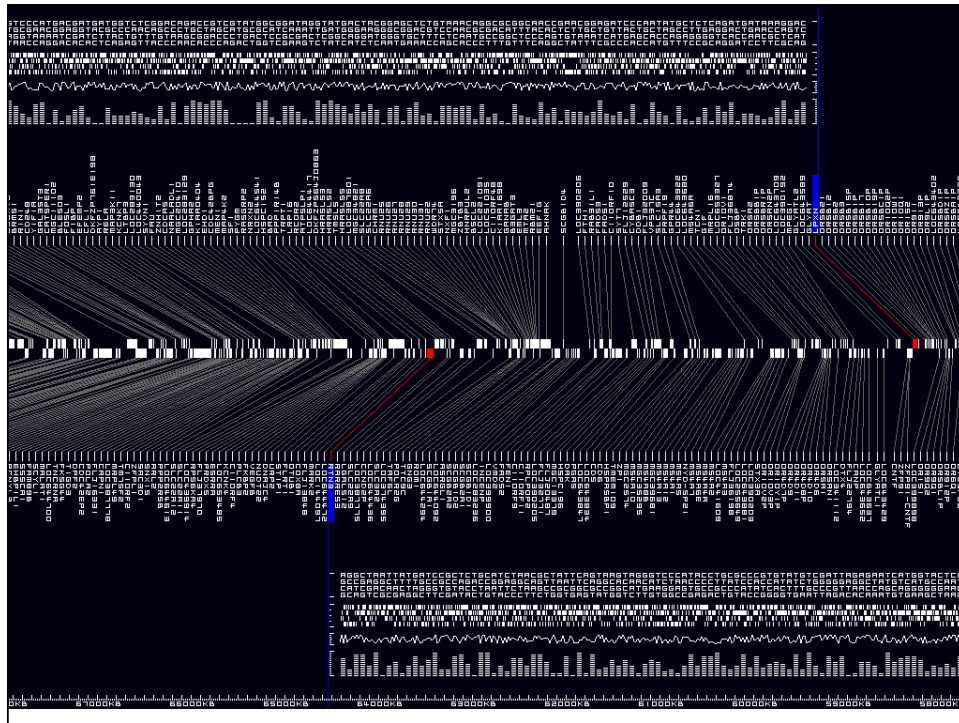
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Culture Specific

- **Scientific visualization** deals with data that has a natural geometric structure (e.g., MRI data, wind flows)
- **Information visualization** handles abstract data structures such as trees or graph
- **Graphic Design:** Emphasis on the aesthetics and language of visual form
- **Visual Analytics:** Science of analytical reasoning through visual interactive interfaces



Conceptual Design

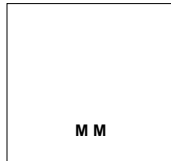
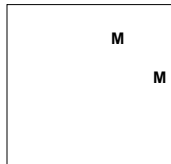
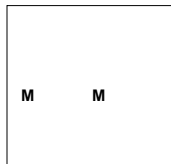
First phase of a project where quick sketches are used for **idea definition**:

- Provides a description of the proposed system
- What are the elements, how do they interface
- What it will look like
- Defines both the functionality and aesthetics of the project

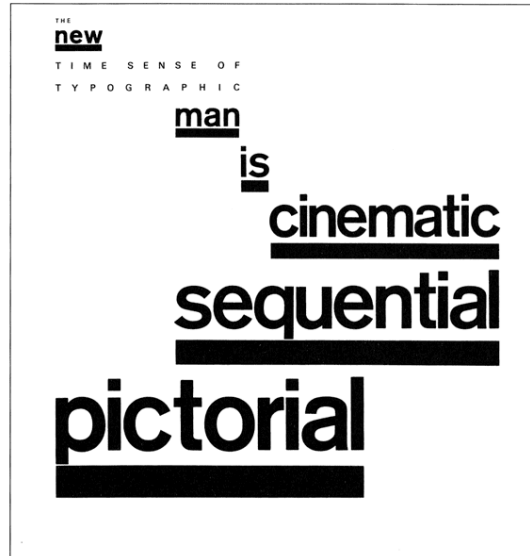
Basic Rules of Design

- How to organize **screen space**
- How to line things up: **Hidden grid system**
- Basic Elements: **Point, Line, Form, color**
- How **color** functions
- **Text and labeling**: What fonts, how much?

Visual Organization (Macro-micro, willi kunz)



- **Size** and **proportion** of space are determined at the beginning
- Space is visually **subdivided** by the **tension** that develops between an **element** and the **boundaries** of the space
- **Space**: Depending on their visual placement within a given space, the **same** elements will assume **different** visual aspects of **weight** and **movement**

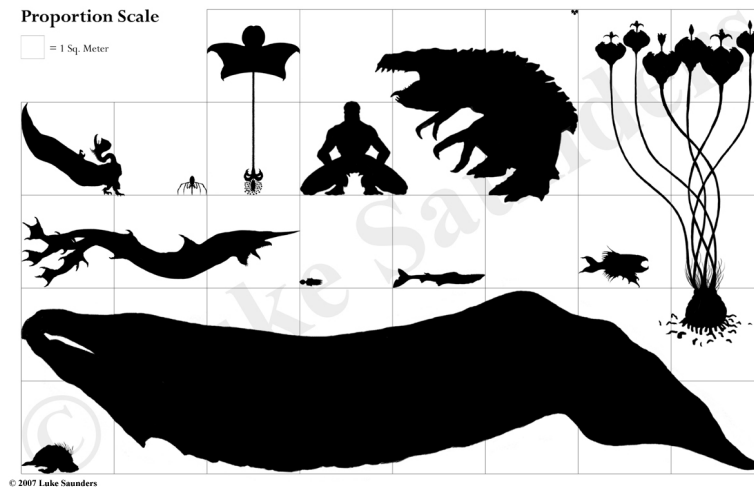


Motion, Movement Through Spatial Organization



- A **space** becomes visually active when it is subdivided
- Balance is achieved through interplay of **scale**, **sequence**, and **spatial position**
- Any object placed next to each other in an image defines a **relationship** through **spatial proximity**

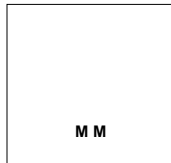
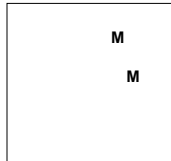
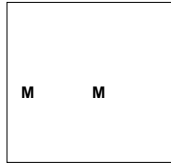
Scale: Relative proportion & measurement



Visual Basic Literacy: Basic Units (Dondis)

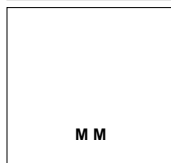
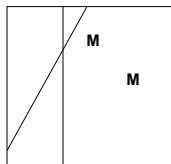
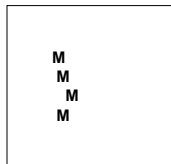
- **Dot:** Minimal unit, pointer, marker of space
- **Line:** Joins dots, articulator of space
- **Shape:** Line describes and encloses space
- **Direction:** Thrust of movement
- **Tone:** The intensity of lightness or darkness
- **Color:** Associative and symbolic meanings
- **Texture:** Quality of touching, looks/feels like
- **Scale:** Relative proportion & measurement
- **Dimensions:** 2D, 3D spatial illusion
- **Motion:** Visual elements guiding the viewer

Visual Language & Syntax



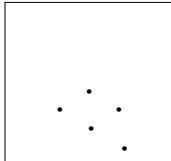
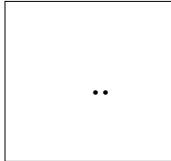
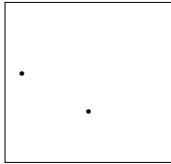
- **Visual language:** Analogous & symbolic
- **Visual Syntax:** partially perceptual, partially conventional (cultural, learned)
- Images represent (They are abstracted information)
- Meaning is constructed (assembled parts)
- **Visual Language** therefore requires apprenticeship (What you see is what you know)
- 2 Layers: **Denotative:** (literal message), **Connotative** (implied sub-text)

Weight, Im/Balance, Dis/Order, Un/Stable



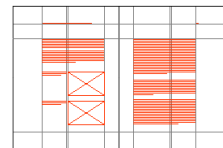
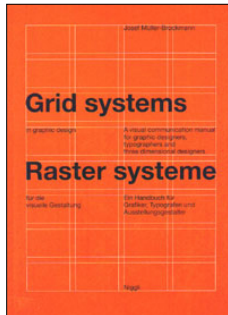
- **Balance:** Physiological, psychological
 - **H-V construct:** man to his environment
- **Stress:** Unstable causes stress
 - Stabilization: relative stress/balance
- **Lower-left:** most stable
- **Harmony:** (centered), no visual surprise
 - Search for balance with off-center mark
- **Ambiguity:** may obscure intent & meaning
 - Slightly off-center mark confounds
- Visual elements in stress location: more weight

Groupings

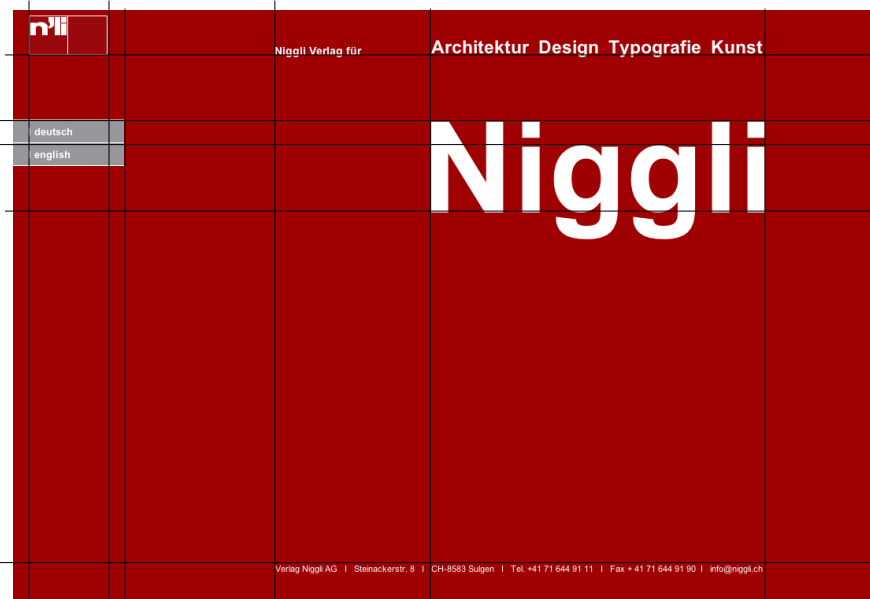


- **Attraction & Grouping:** 2 dots fight for attention in their interaction
- **Distanced:** Create individual statements as they repel each other
- **Close together:** The more complicated the forms they describe - There is an attraction force
- **Perception:** dictates to make whole out of units
 - Connect the dots!!
 - Visual phenomenon for astronomical signs
- **Opposites repel, similars attract**

Structure: the Grid System



- **Modular Grids:** Modules determine the dimensions and placement of graphic and typographic elements
- All elements are **consistently** placed according to the **pre-determined structure** once it has been defined
- The grid functions as an **organizational** device, but stays **invisible**
- Structural order also requires **imagination**
- Design process: begin with **intuition** and **visual judgement**, follow with rational structure



Color Relationships

- Black & White or color?
- If **black and white** – what about grey tones?
- If **color**, how many? (Limit to 3 to 6?)

Design As Concept & System

- Visual Identity: Gives an overall identity, a branding through formal design choices (form, color, font, etc.)



MAT 259 Visualizing Information

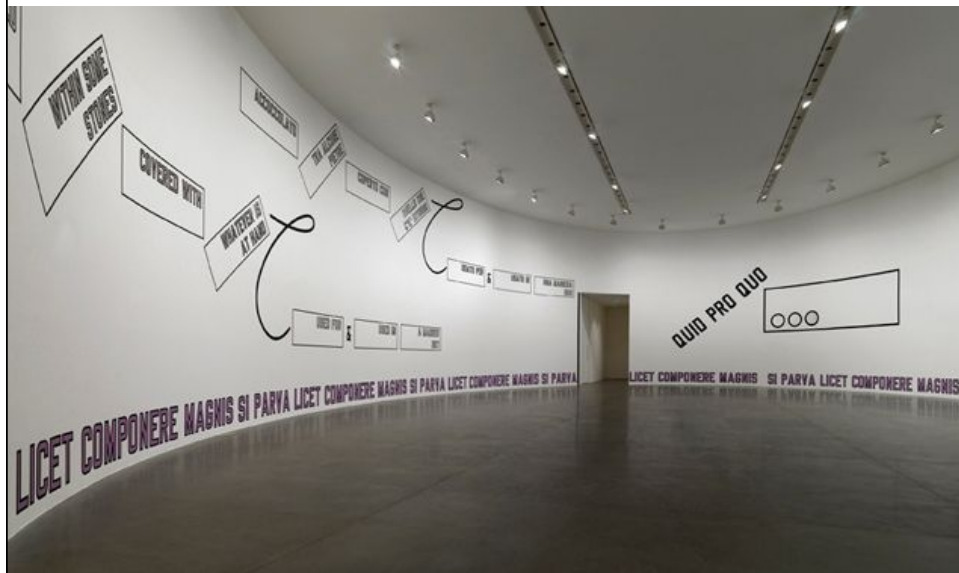
Bruce Mau Design: [SPL](#)

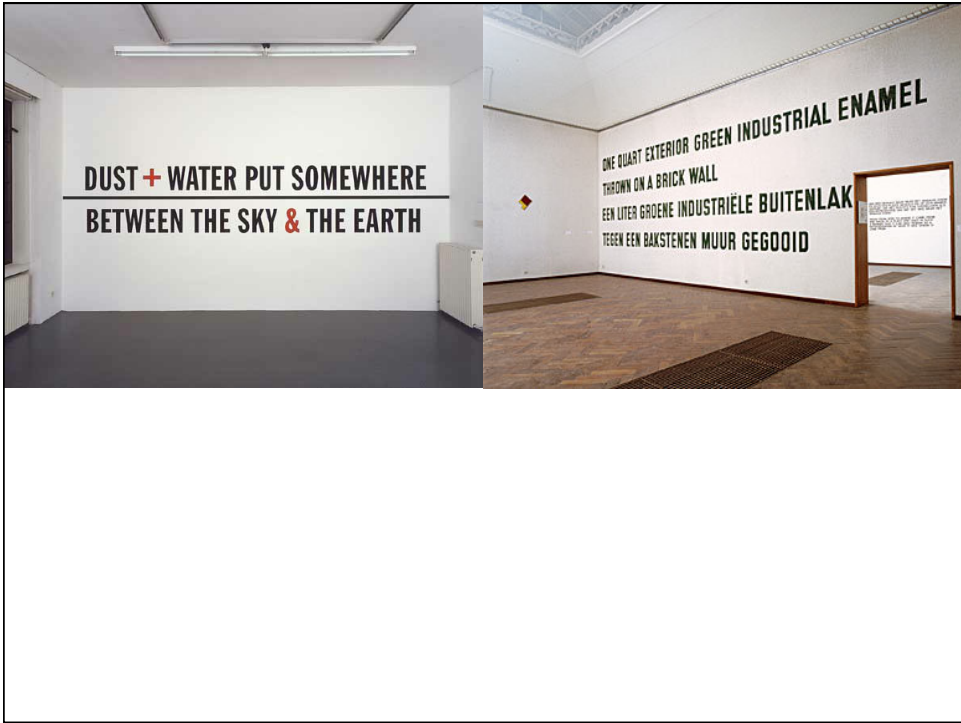




MAT 259 Visualizing Information

Which font?





Resources: Some Design Firms & Others

- [Metadesign](#)
- [Bruce Mau \(SPL\)](#)
- [LTL \(Architectural design\)](#)
- [Columbia School of Architecture](#)
- [Sensible City MIT](#)
- [LTL Architects](#)
- [Herzog de Meuron](#)
- OMA -