

Lecture 2: Design of Visual Displays

Segmentation and variables of the display plane. Modes of correspondence.

Position in the course

- Theory driven approaches to HCI
- **Design of visual displays**
- Goal-oriented interaction
- Designing smart systems (guest lecturer)
- Designing efficient systems
- Designing meaningful systems (guest lecturer)
- Evaluating interactive system designs
- Designing complex systems

Today's objective

- Gain a vocabulary for analysis and critique of visual displays
- Place visual design options within a universal framework
- Understand the range of options for design innovation
- Revisit familiar aspects of the “screen world” from a historically-informed design research perspective

Themes in this lecture

- Typography and text
- Maps and graphs
- Schematic drawings
- Node-and-link diagrams
- Icons and symbols
- Visual metaphor
- Pictures – perspective and framing
- Unified theories of visual representation
 - encyclopaedia article, with accompanying videos, available at interactiondesign.org

Typography and text



at the east end of the passage.

There is a small wicker cage discarded nearby.
light lamp

Your lamp is now on.
look

You are crawling over cobbles in a low passage. There is a dim light
at the east end of the passage.

There is a small wicker cage discarded nearby.
take cage

OK
^

You are in a debris room filled with stuff washed in from the surface.
A low wide passage with cobbles becomes plugged with mud and debris
here, but an awkward canyon leads upward and west. A note on the wall
says "Magic word XYZZY".

A three foot black rod with a rusty star on an end lies nearby.
^

digital VT101

```
*****log_files*****
```

```
Verbose
```

```
Test Error
```

```
VTS Kernel Error
```

```
Information
```

```
Unix Msgs
```

```
Report
```

```
*****[DONE:ESC]*****
```

Neue Grafik New Graphic Design Graphisme actuel

International Review of graphic design and visual culture. Edited by Herbert Lubowicz, Jean-Claude Martigny, and Sylvain Lippman. Founded in 1969 in Paris.

1

Editors
Herbert Lubowicz
Jean-Claude Martigny
Sylvain Lippman

English September 1988
Volume 15, Number 3
100 pages
30 cm, 400 g

French September 1988
Volume 15, Number 3
100 pages
30 cm, 400 g

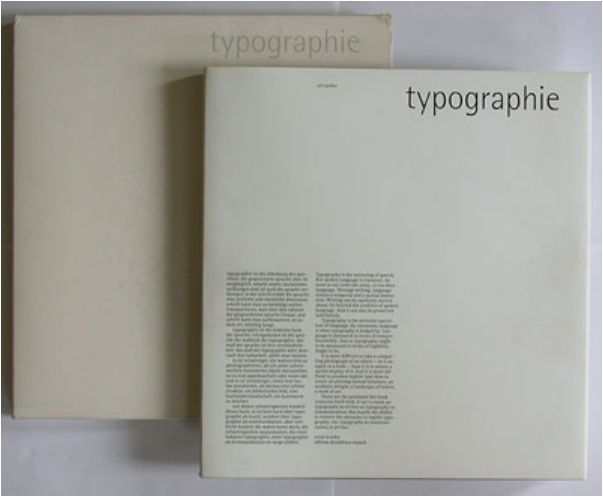
Spanish September 1988
Volume 15, Number 3
100 pages
30 cm, 400 g

Author and Publisher
Editions Le Bord de l'eau
130 Avenue de France
91120 Palaiseau

Author and Publisher
Editions Le Bord de l'eau
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The Grid System - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.thegridsystem.org/

Most Visited Getting Started Latest Headlines

egyptian statue, egyptian god, egyptian god, egyptian god x The Grid System

The Grid System

The ultimate resource in grid systems.

"The grid system is an aid, not a guarantee. It permits a number of possible uses and each designer can look for a solution appropriate to his personal style. But one must learn how to use the grid; it is an art that requires practice."
Josef Müller-Brockmann

Show Grid

Join The Forum

Search

Articles

30 Grid-Based WordPress Themes

In this article we have 30 WordPress themes have been developed using a popular CSS Grid Frameworks such as the 960.gs, Blueprint, YUI2 and The Golden Grid.
23.Aug.2010

Design & Build a Grid Based Web Design with CSS

Step by step walkthrough of the design and build process of a grid based WordPress theme. From the initial Photoshop concept, through development.
23.Aug.2010

Long Live the 12-Column Grid

When I first crossed the great divide from print to web, one of the earliest things I tried to do was introduce a flexible multi-column grid (you know, like a magazine).
07.May.2010

[View All Articles](#)

Tools

960 Grid System Photoshop Action

These actions will create a Photoshop document ideal for laying websites out in 12, 10, 8, 6 and 4 columns.
23.Aug.2010

iPhone Grid System

A 12.8 (480.320) modular grid system for the iPhone, with the unit of 40px and the gutter of 5px.
23.Aug.2010

Fluid Grid

A web grid system that allows designers to use the screen real estate on large monitors and retain great design on smaller ones.
07.May.2010

[View All Tools](#)

Books

Universal Principles of Design

Universal Principles of Design is the first comprehensive, cross-disciplinary encyclopedia of design.
04.Nov.2009

Designing for the Web

A Practical Guide to Designing for the Web has written explanations of the core principles of graphic design in relation to the web.
08.Oct.2009

The Way of Typography

The book also goes into depth on how to create grid systems by hand with only pencil, straightedge and compass.
18.Sep.2009

[View All Books](#)

Templates

The Golden Grid Template

A PSD template based on the CSS framework The Golden Grid by Vladimir Carrer.
02.Mar.2010

Photoshop 4 Column Grid

A free 4 Column Photoshop grid template for a 1024x768 screen resolution by Ray Gulick.
08.Jun.2009

InDesign 568x792 Grid System (12)

By Dario Galvagno. Adobe InDesign file with a grid system for a 568pts x 792pts page that is divided into 12 columns and rows using the Golden Ratio. Includes a 12pt baseline grid.
16.Apr.2009

[View All Templates](#)

Blog

Forum is back up!

Sorry for the downtime on the forums. They're back up now.
07.May.2010

Sushi & Robots

Beautifully personal portfolio by Jina Bolton that reveals the site grid and baseline grid.
07.May.2010

Bisgrafic

Lovely grid site design by Barcelona based Bisgrafic.
07.May.2010

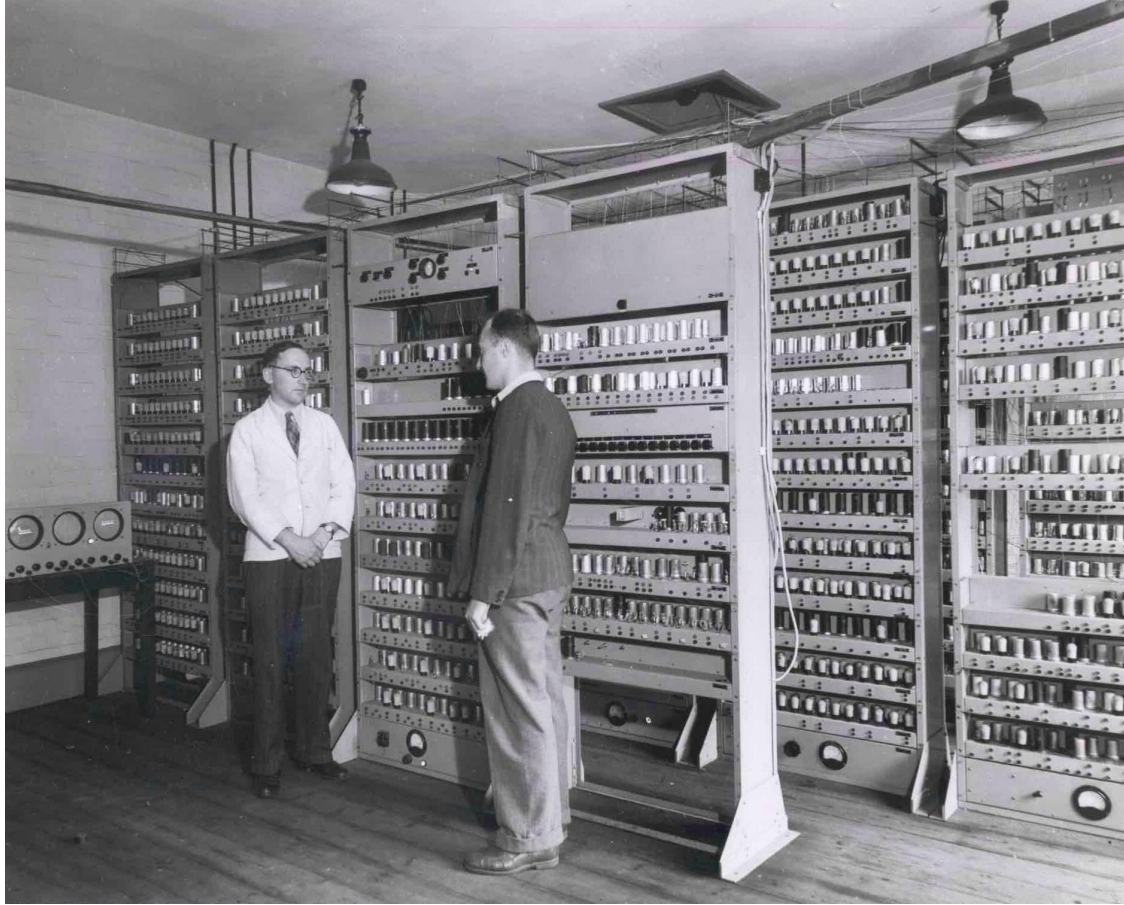
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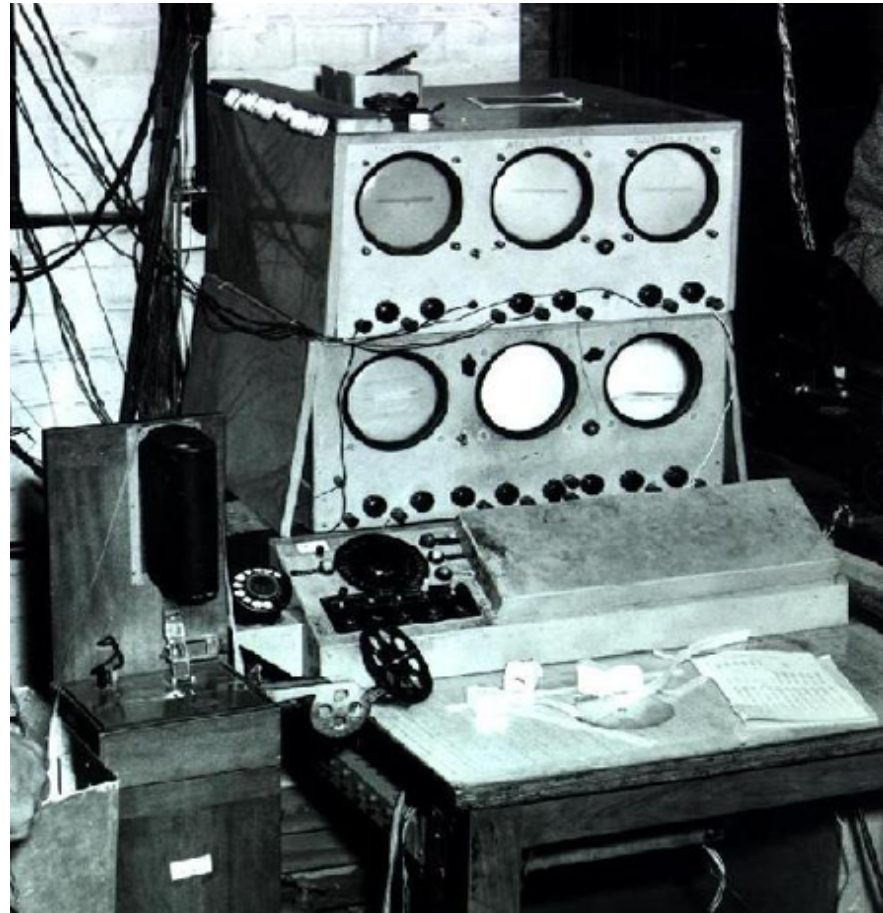
Inspiration

- [Ace Jet 170](#)
- [AisteOne](#)
- [Athletics](#)
- [BBDK](#)
- [Blanka](#)
- [Build](#)
- [Corporate Risk Watch](#)
- [Counter Print](#)
- [David Airey](#)
- [Design Assembly](#)
- [Dirty Mouse](#)
- [Experimental Jetset](#)
- [Form Fifty Five](#)
- [Grafik Magazine](#)
- [Grain Edit](#)
- [Graphic Hug](#)
- [I Love Typography](#)
- [Lamosca](#)
- [Mark Boulton](#)
- [Minimal Sites](#)
- [Monocle](#)
- [Neubau](#)
- [NewWork](#)
- [OK-RM](#)
- [Original Linkage](#)
- [Robin Uleman](#)
- [SampsonMay](#)
- [Schmid Today](#)
- [September Industry](#)
- [Soulellis](#)
- [Subtraction](#)
- [Swiss Legacy](#)
- [The International Office](#)
- [Thinking for a Living](#)
- [This Studio](#)
- [Toko](#)
- [Typographic Posters](#)
- [Visuelle](#)
- [Xavier Encinas](#)
- [Year of the Sheep](#)

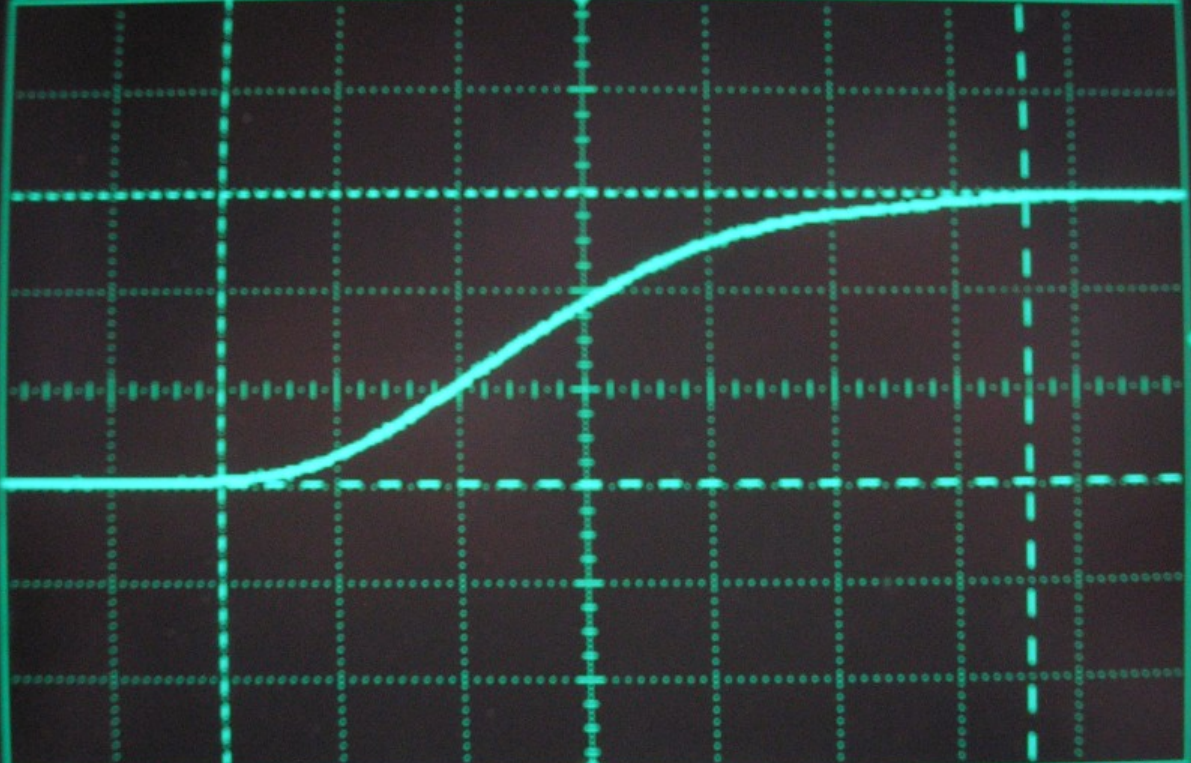
Done zotero

Maps and graphs



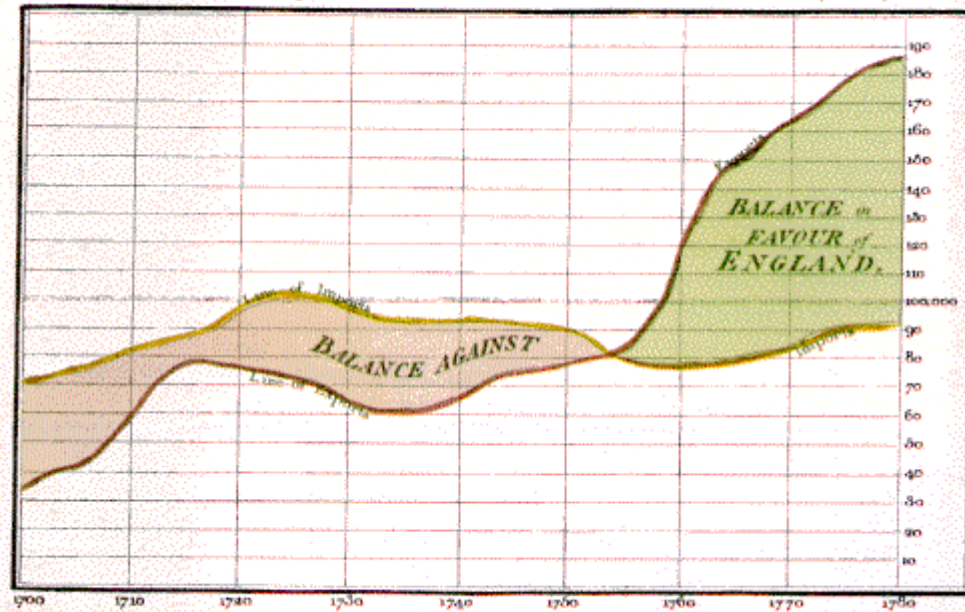


1 5.00V -0.00s 20.00/ f1 RUN



t1 = -60.00ns t2 = 72.00ns $\Delta t = 132.0ns$ $1/\Delta t = 7.578Hz$
Source V1 Active Cursor t1 Clear
2 3 4

Exports and Imports to and from DENMARK & NORWAY from 1700 to 1780



The Bottom line is divided into Years, the Right hand line into L10,000 each.
 Published at the Kit House, 17, St. Mark Lane, by W. Playfair. Math. and Phil. Soc. Lond.



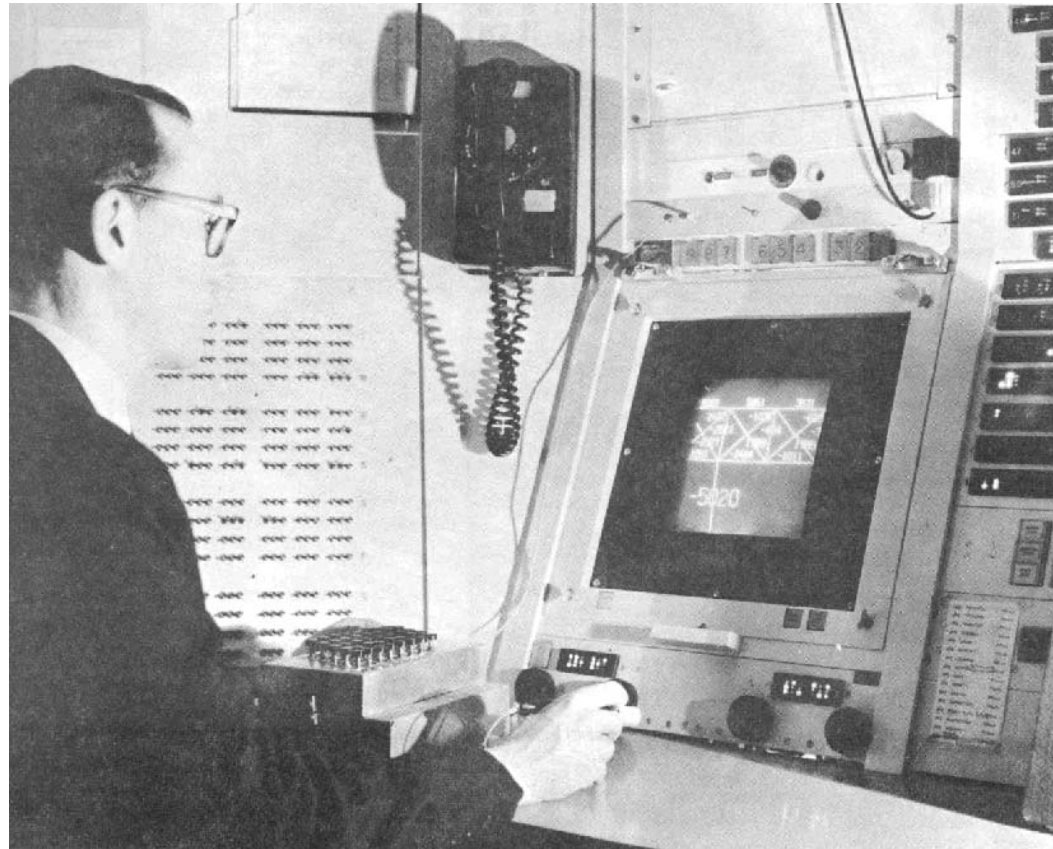


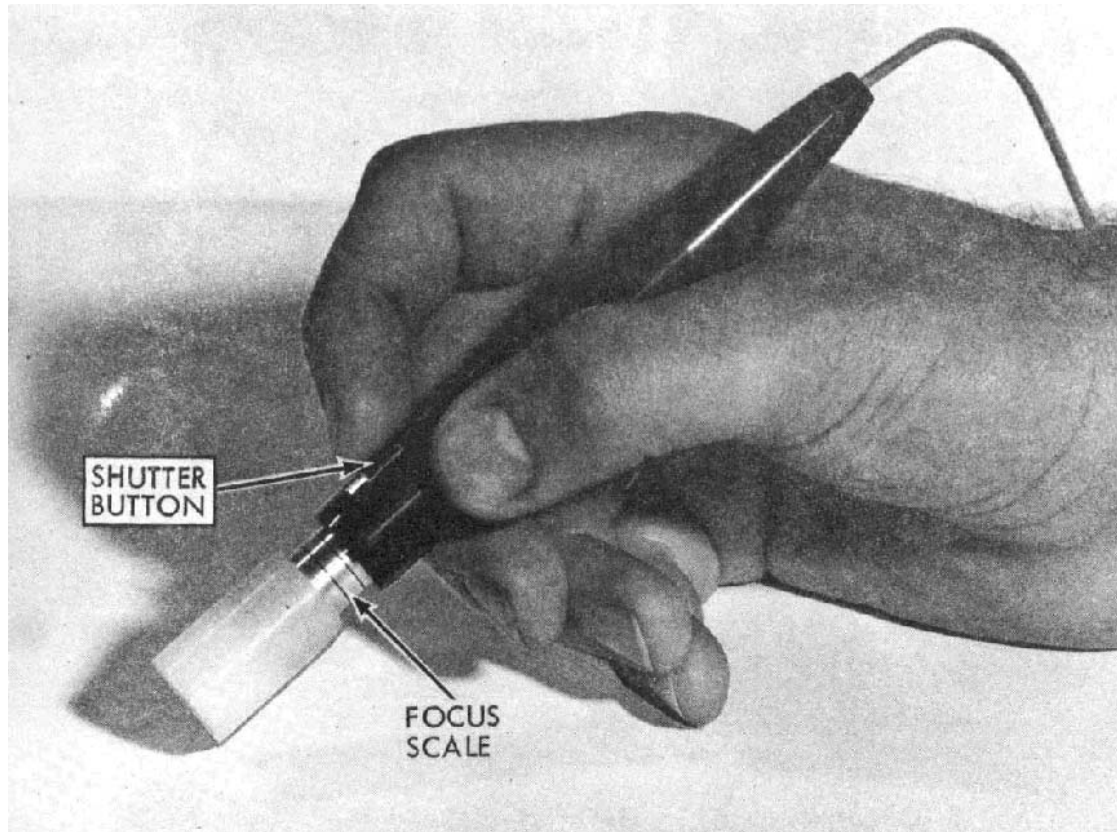


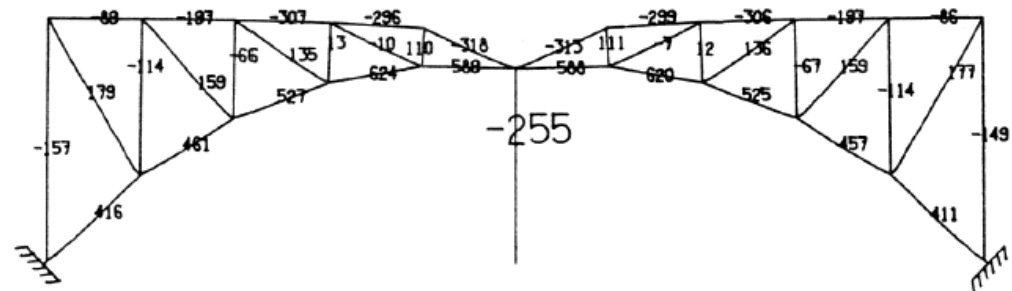
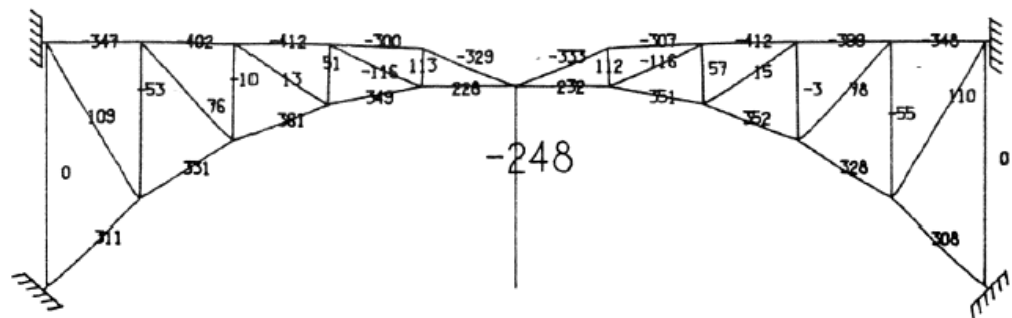


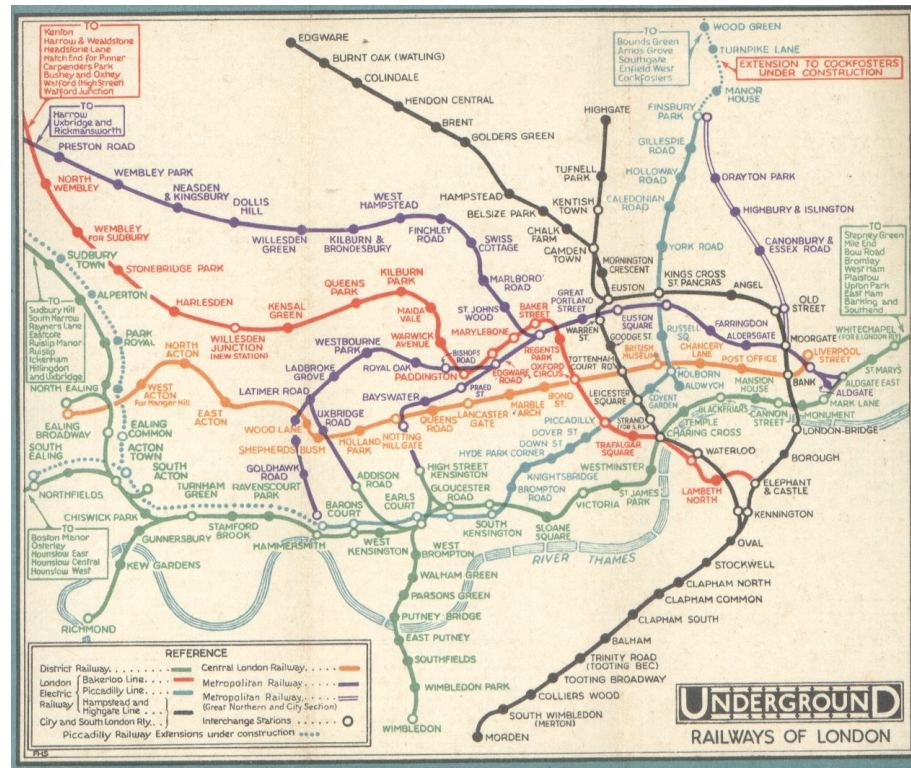


Schematic drawings



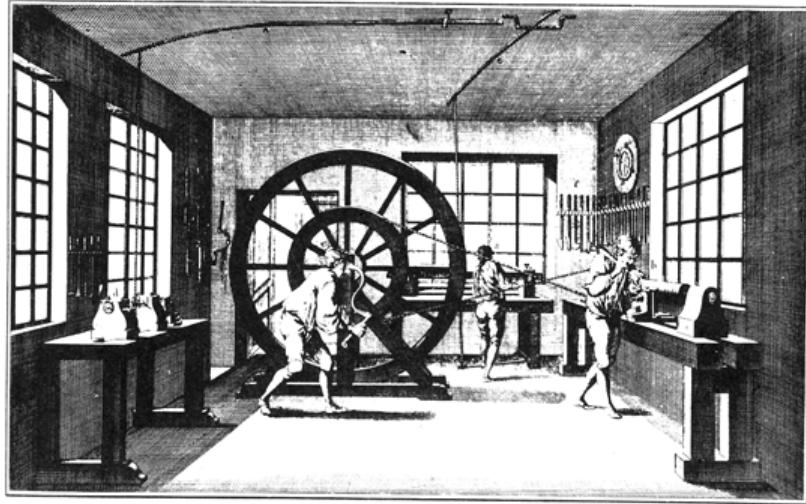


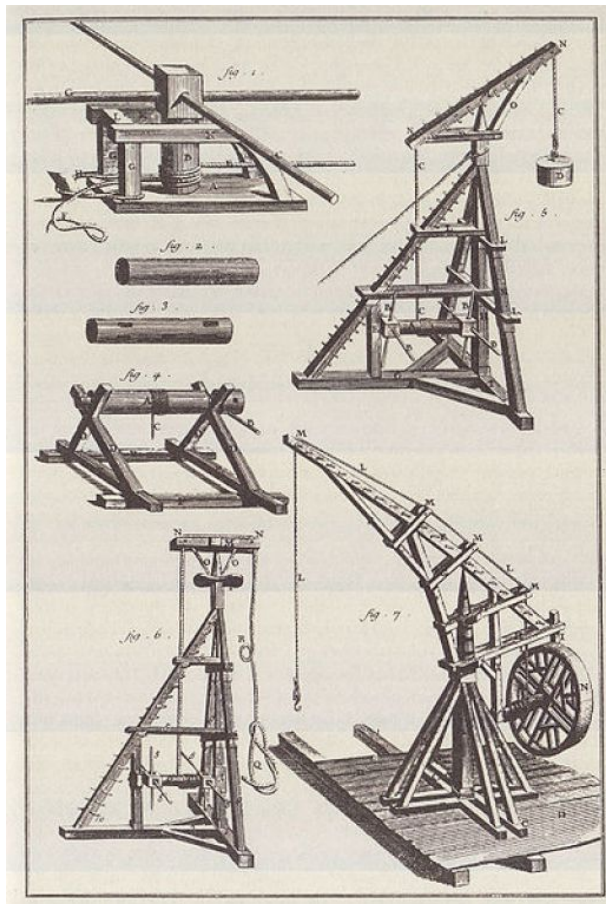


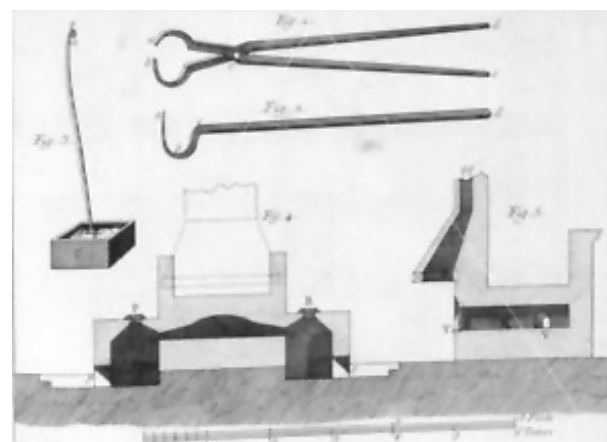
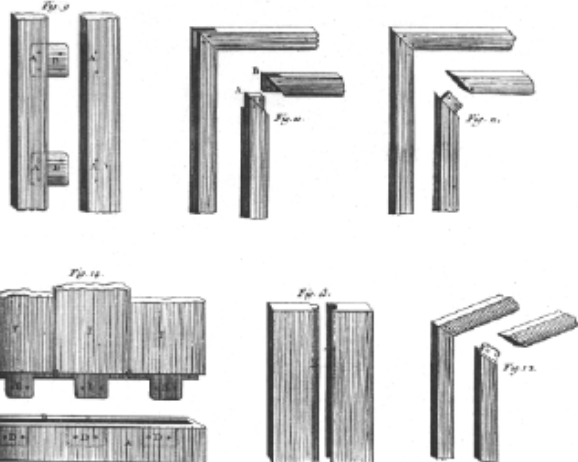
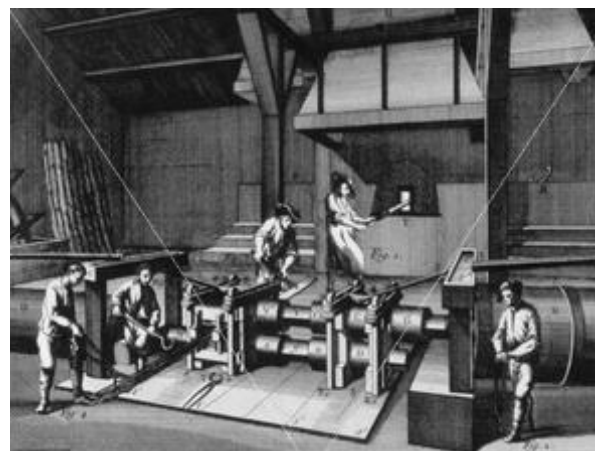
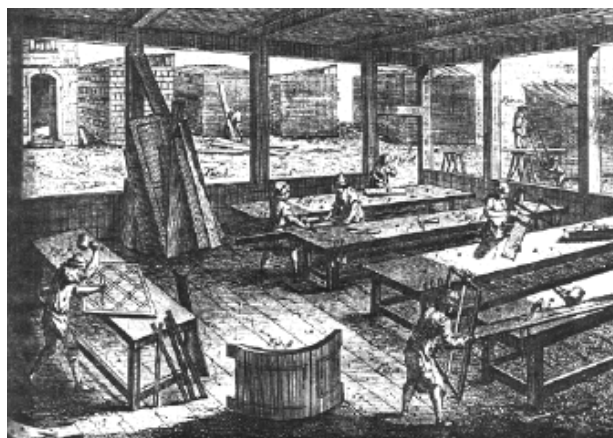




H. C. BECK







Node-and-link diagrams

Posture de La main et du Canif.



Couper différentes de la Plume.

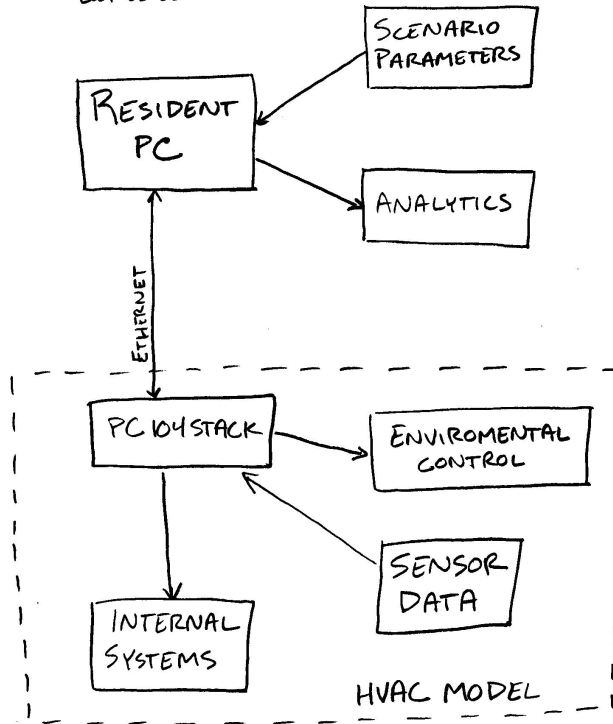


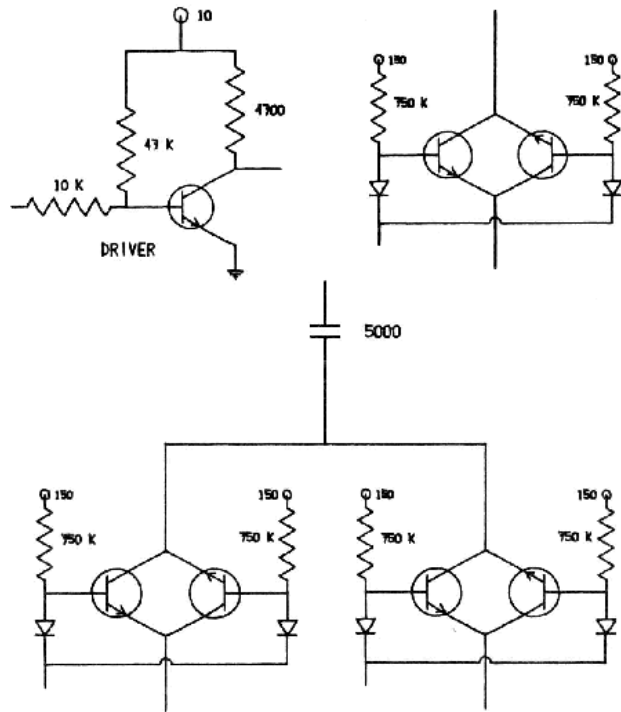
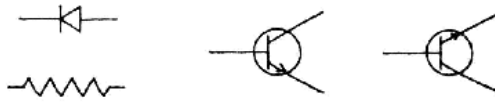
Proportions d'une Plume taillée.



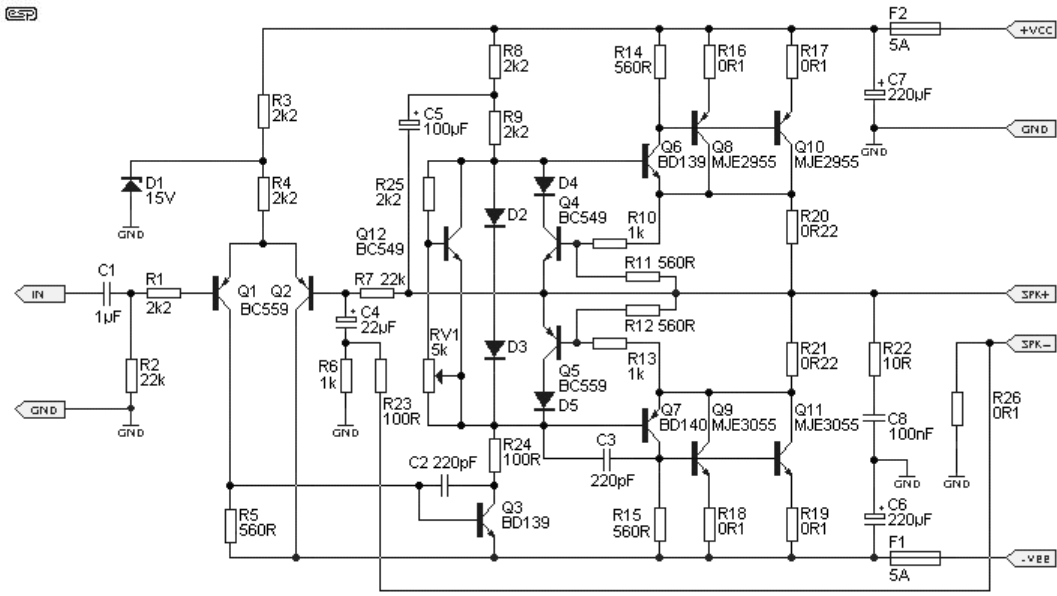
CONTROL SYSTEM ARCHITECTURE

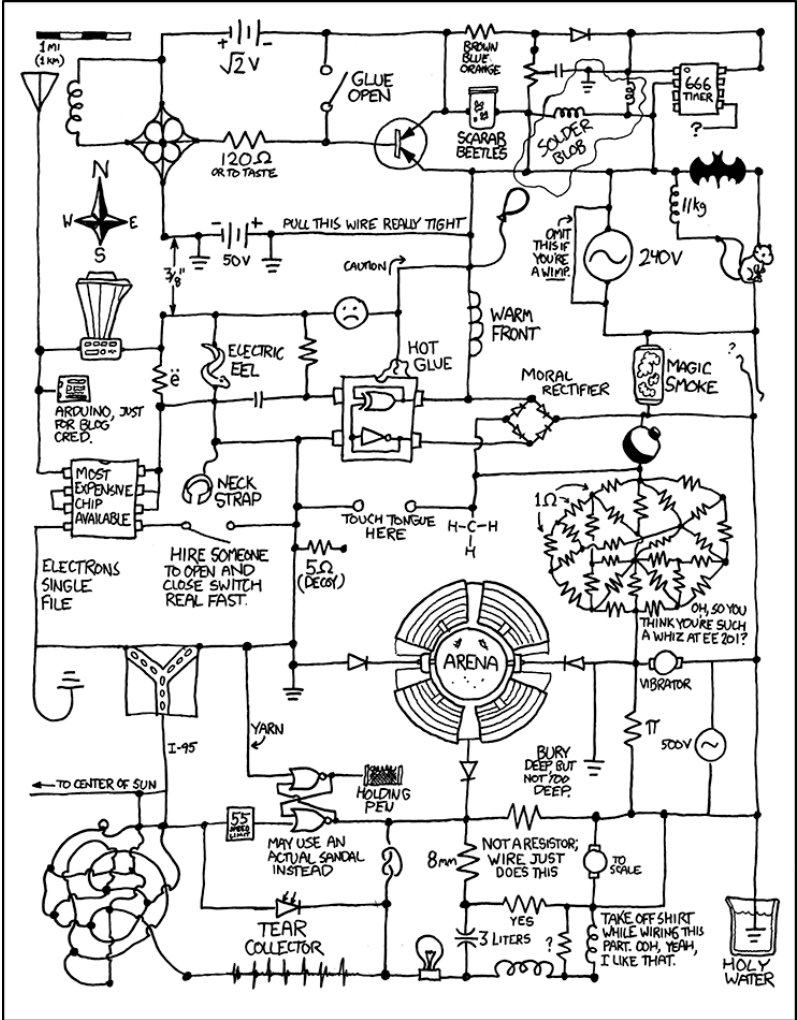
2007-02-08





ESP





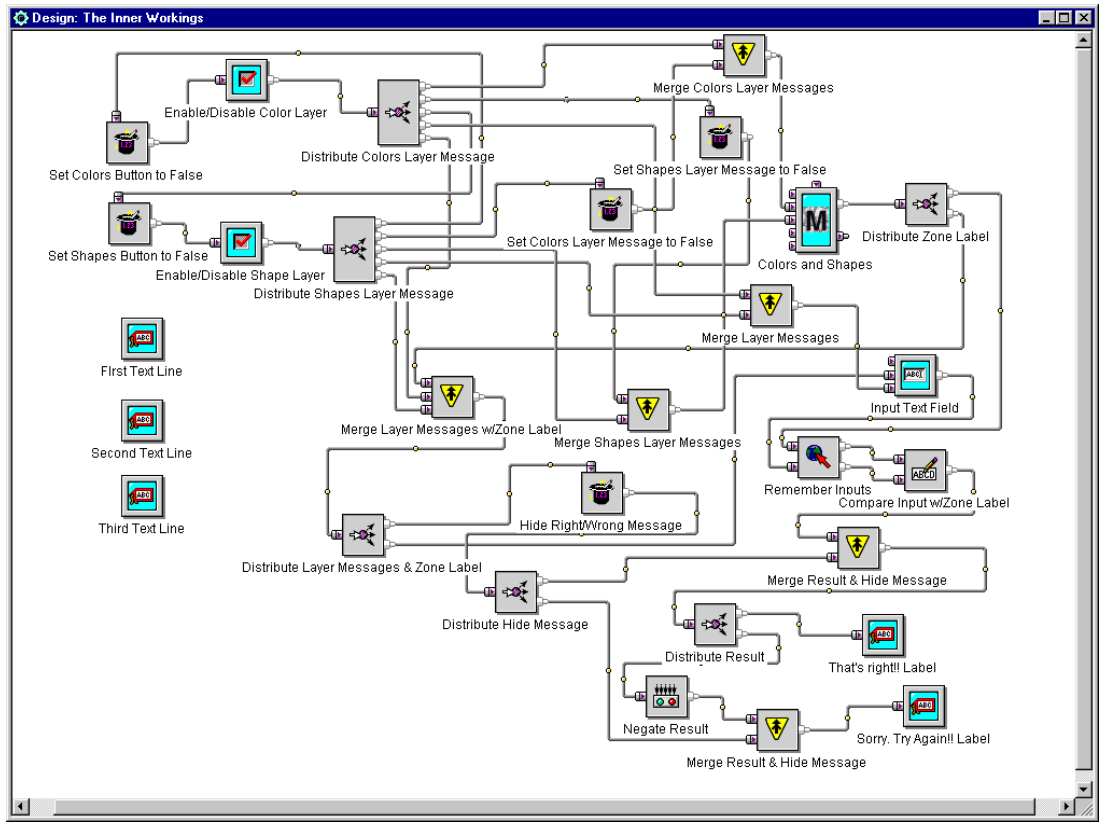
<http://xkcd.com/730/>
xkcd: circuit diagram

The image shows a screenshot of a Java IDE window titled "bluej: address-book-v1g". The window is divided into several panes:

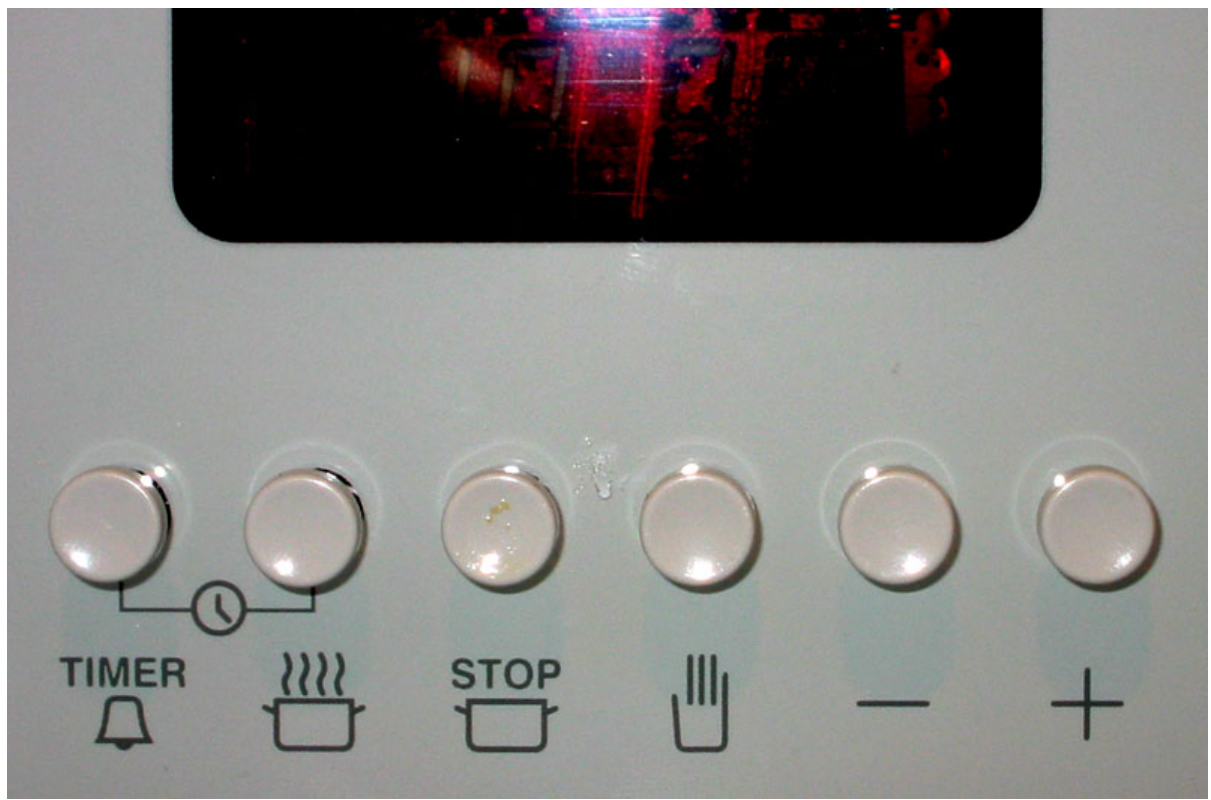
- Class Diagram:** Located in the upper right, it shows a class hierarchy. At the top is "AddressApplet" (labeled as "Applet"). Below it are "AddressBookDemo" and "AddressBook". "AddressBook" has a solid line to "ContactDetails" and a dashed line to "AddressBookGU". "AddressApplet" has dashed lines to "AddressBookDemo" and "AddressBook".
- Source Code:** The lower left pane shows the source code for the "AddressBook" class. It includes imports for Java utility classes and a class definition with a private TreeMap and an integer field.
- Project Explorer:** On the left, it shows the project structure with "AddressBook" as the main package.
- Toolbar:** Above the source code, there are buttons for "New Class...", "Compile", and "Run".
- Output Console:** At the bottom, it shows a message "Creating object... Done" and a "saved" button.

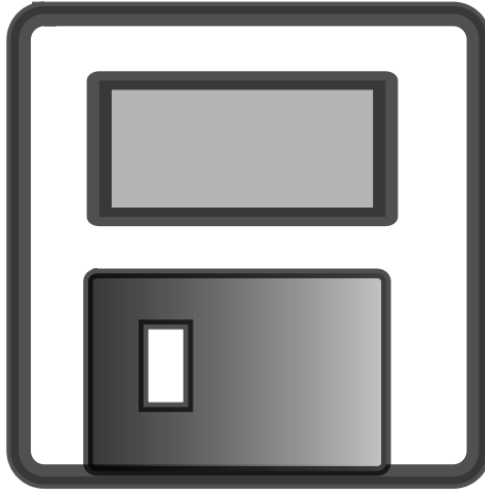
```
import java.util.Iterator;
import java.util.LinkedList;
import java.util.SortedMap;
import java.util.TreeMap;
import java.util.TreeSet;

/**
 * A class to maintain
 * Details are indexed
 * @author David J. Bar
 * @version 2002.05.08
 */
public class AddressBook
{
    // Storage for an arbitrary number of details.
    private TreeMap book;
    private int numberOfEntries;
```



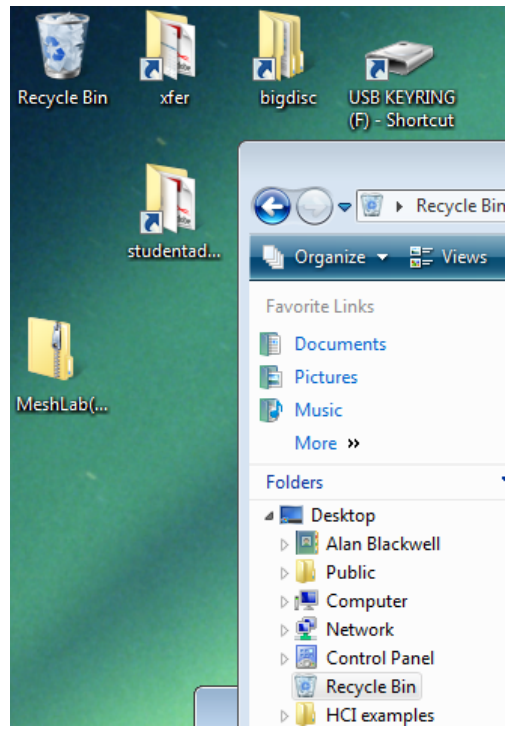
Icons and symbols











Recycle Bin

xfer

bigdisc

USB KEYRING
(F) - Shortcut

studentad...

MeshLab(...)

← → ↻ ↺ Recycle Bin

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Alan Blackwell

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Computer

Network

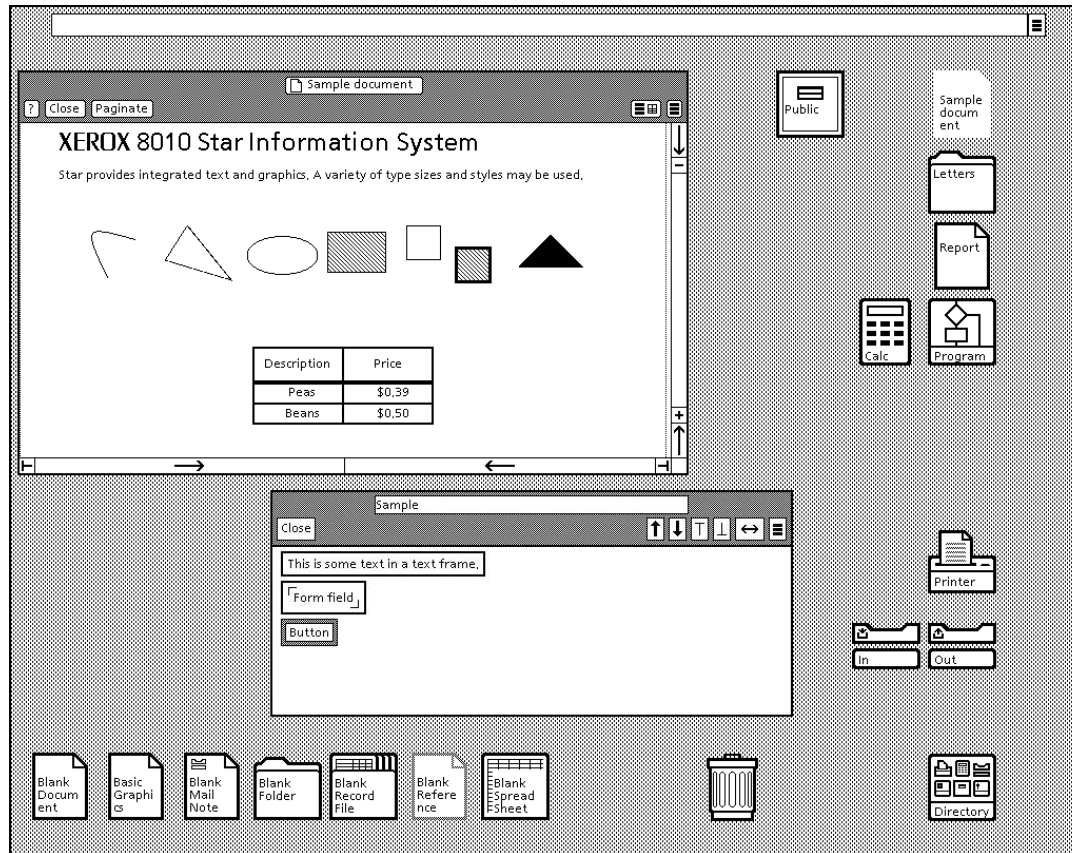
Control Panel

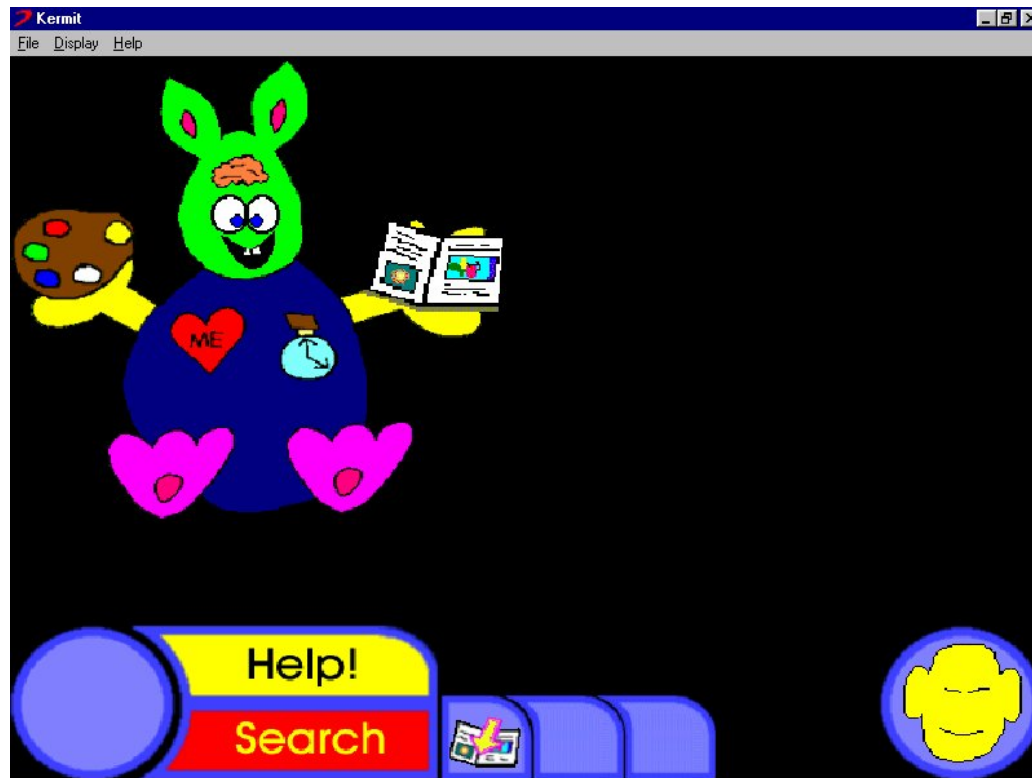
Recycle Bin

HCI examples

Visual metaphor

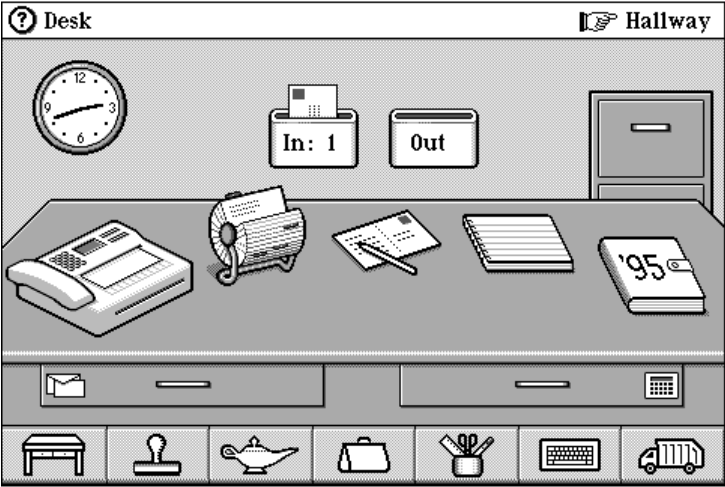






Sony “Magic Link” (1994)





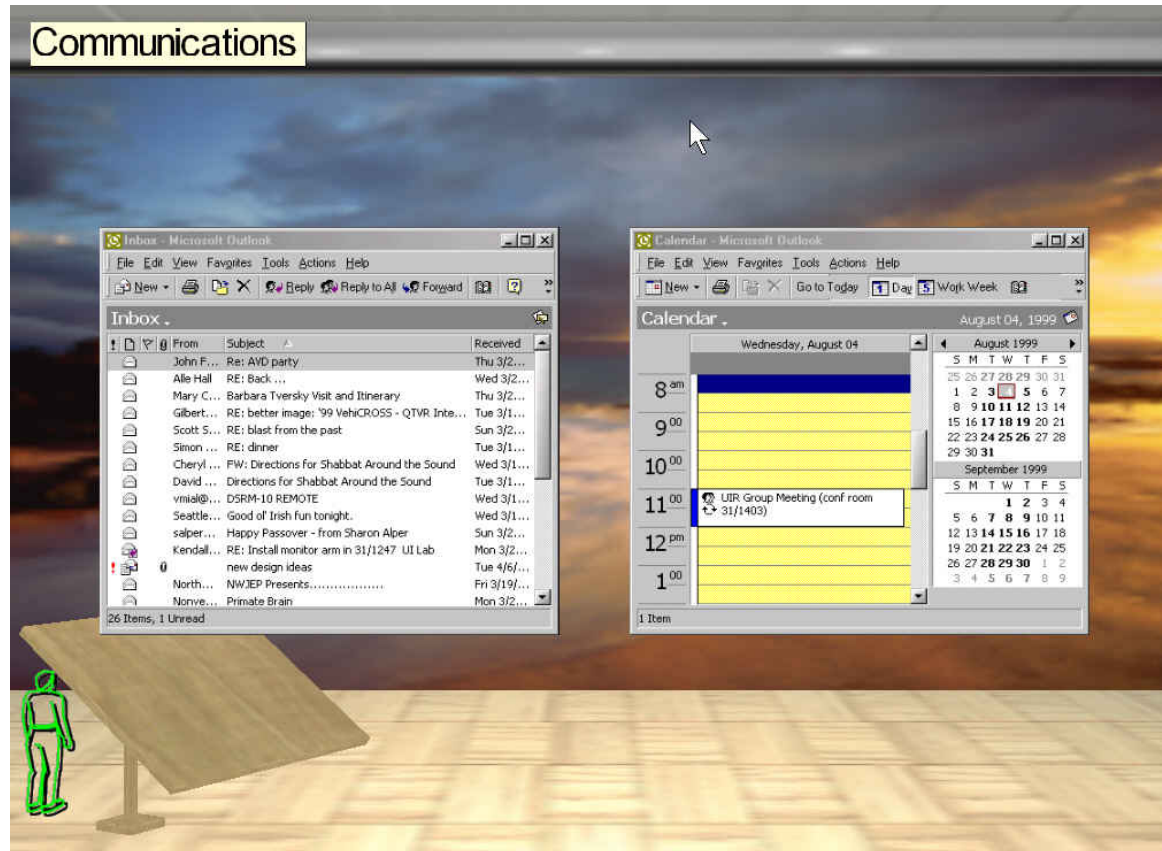
Microsoft "Bob" (1995)



Microsoft “Task Gallery” (2000)



Communications

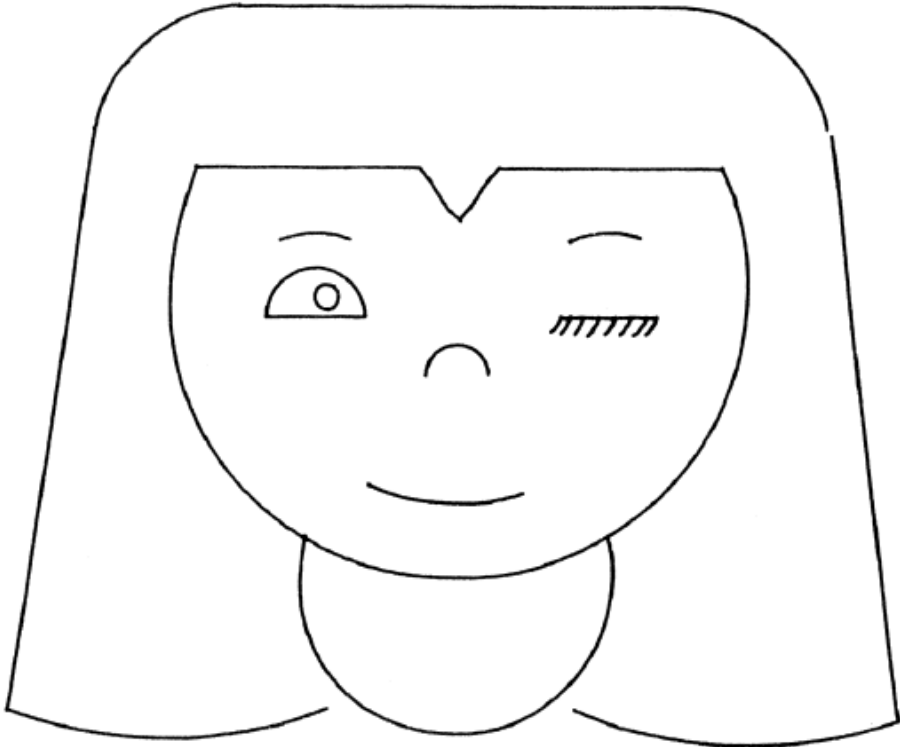


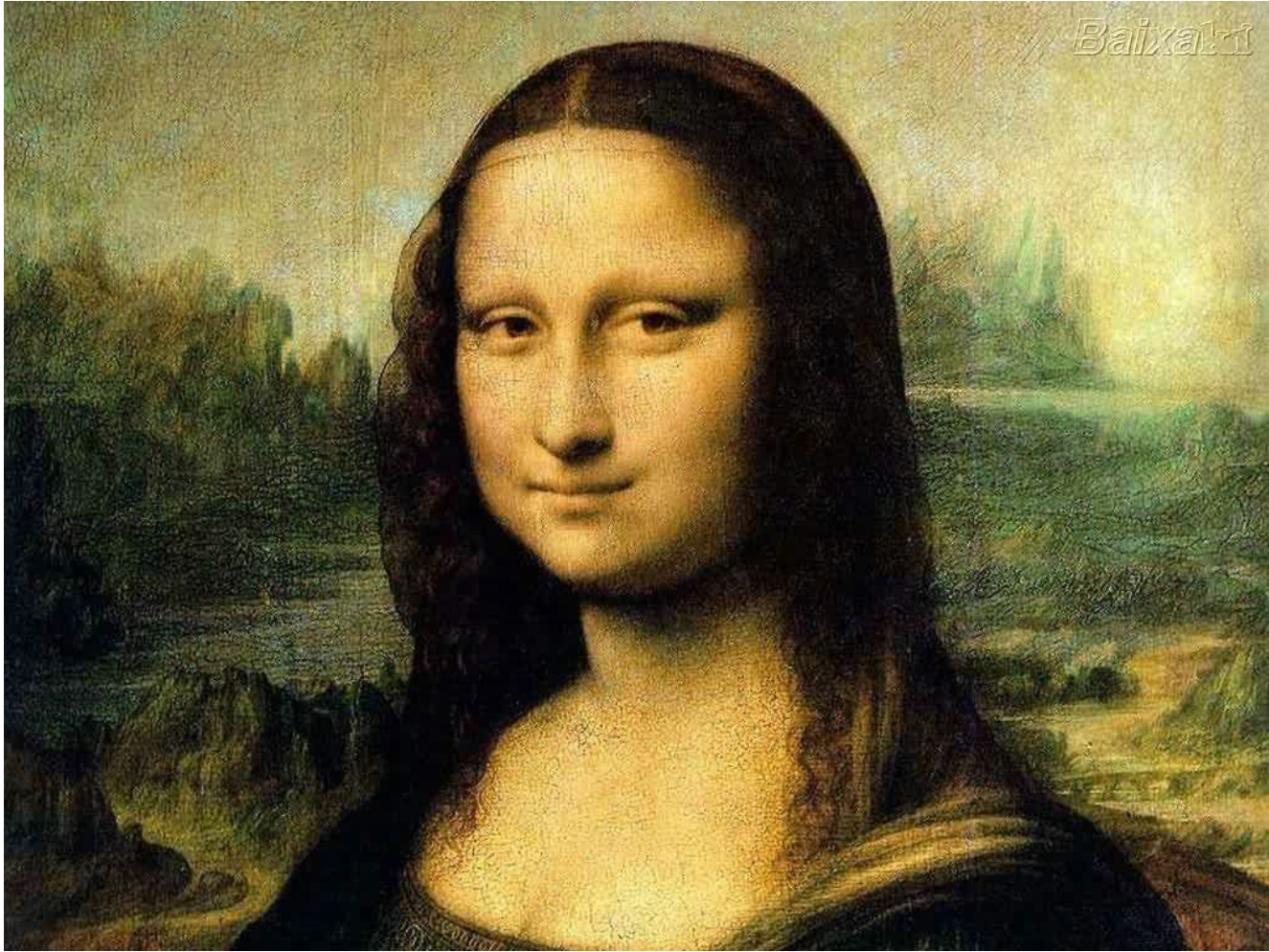


MIUI “Warm Space MiHome Desktop” (2015)



Pictures













Crossfire GTK Client

File Client Action Help

Inventory: 299.0 / 3500 Count: 0

| Name | Weight |
|--------------------------|--------|
| scroll case of Holding * | 0.5 |
| quiver of arrows | 0.1 |
| magnifying glass | 2.0 |
| Unholy Bow | 9.0 |
| Unholy Bow | 9.0 |
| fourteen arrows | 0.4 |
| five arrows | 0.1 |
| three arrows | 0.1 |
| bolt | 0.1 |
| nine bolts | 0.5 |
| nine bolts | 0.5 |

Player: Chrisll the ancient cold dragon
 Score: 1914353147 Level: 109
 S27 D22 Co28 I19 W15 P30 Ch23
 Wc-94 Dam 17 Ac-16 Arm 75
 Speed: 1.80 (6.02)
 Range: nothing

| | | | |
|-------------|--------------|-------------|-------|
| smithery | 316706 (9) | bowyer | 938 |
| jeweler | 320472 (9) | alchemy | 83727 |
| literacy | 1954740 (12) | bargaining | 14660 |
| spell magic | 874828 (40) | spell magic | 765 |

NOTE: This server runs latest CVS code. This means that stability may not be the highest, but it will have all the latest bells and whistles. This also means games features and other aspects may change unexpectedly.

Since this server uses the latest split skill code, it is possible that old clients may have problems. If you see stability problems with your client, please make sure you have the latest client (from CVS) installed.

Chrisll has entered the game.
 No mail...
 Wrager has entered the game.
 Leon shouts: anyone have 2 improve damage scrolls they want to sell or trade?

Welcome Back:
 Players:
 Hoz the Diligent [/home/crossfire/var/crossfire/players/Hoz/_s2
 corn_apartment_apartments]Peaceful
 Leaf the AFK [/HallOfDMs] [WIZ]Peaceful
 Lancen the Shadow Knight [/home/crossfire/var/crossfire/pla
 yers/Lancen/_scorn_apartment_apartments]Peaceful
 Kamy the elf [/home/crossfire/var/crossfire/players/Kamy/_s2
 corn_apartment_apartments]Peaceful
 Perle the big cold dragon [/lake_country/shops/Olds_jewel]P
 eaceful
 FireStar the fireborn [/scorn/crow/train/zombie]Peaceful
 lumbra the elf [/pup_land/raffle/raffle1_u3]Peaceful
 lumenaso the elf [/scorn/crow/train/zombie]Peaceful
 Korusef the fireborn [/home/crossfire/var/crossfire/players/K
 orusef/_scorn_apartment_apartments]Peaceful
 Wumpus the elf [/home/crossfire/var/crossfire/players/Wump
 us/_scorn_apartment_Apartments2]Peaceful
 Boltozar the Wraith [/HallOfSelection]Peaceful
 Casper the Damned Heretic [/wolfsburg/guilds/damned_here
 tics/upper]Peaceful
 neptune the ancient electricity dragon [/scorn/crow/train/train
]Peaceful
 destru the Damned Heretic [/wolfsburg/guilds/damned_hereti
 cs/upper]Peaceful
 Leon the Elven Monk [/world/world_128_109]Peaceful
 Chrisll the ancient cold dragon [/home/crossfire/var/crossfire/
 players/Chrisll/_scorn_apartment_apartments]Peaceful

Close You see:

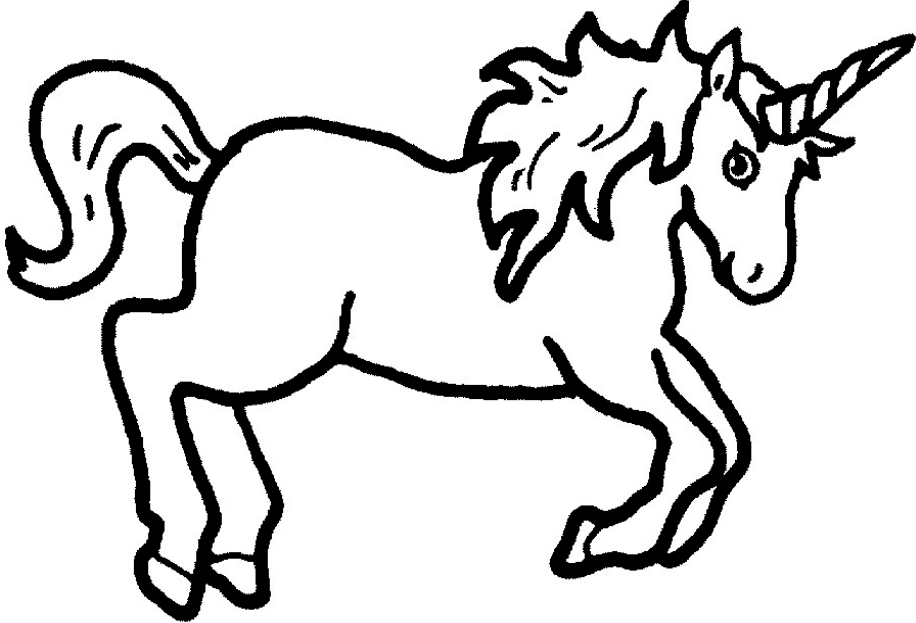
| Name | Weight |
|----------------|--------|
| bed to reality | |
| woodfloor | |

Hp: 431/431
 Sp: 413/413
 Gr: 335/273
 Food: 858

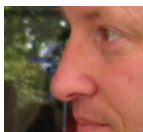
| | |
|-------|------|
| armor | +75 |
| magic | +69 |
| fire | +71 |
| elec | +61 |
| cold | +56 |
| acid | +39 |
| drain | +100 |
| pois | +43 |
| fear | -100 |
| depl | +100 |
| death | +100 |



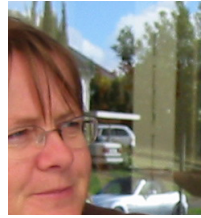




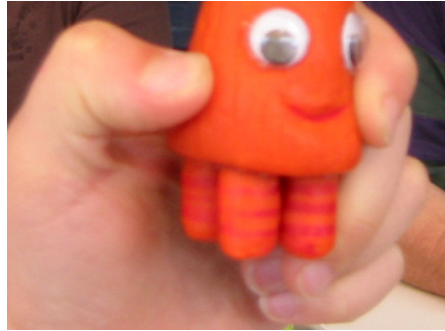
















Unified theories of visual representation

| | Graphic Resources | Correspondence | Design Uses |
|----------|---|--|---|
| Marks | Shape Orientation Size Texture Saturation Colour Line | Literal (visual imitation of physical features) Mapping (quantity, relative scale) Conventional (arbitrary) | Mark position, identify category (shape, texture colour) Indicate direction (orientation, line) Express magnitude (saturation, size, length) Simple symbols and colour codes |
| Symbols | Geometric elements Letter forms Logos and icons Picture elements Connective elements | Topological (linking) Depictive (pictorial conventions) Figurative (metonym, visual puns) Connotative (professional and cultural association) Acquired (specialist literacies) | Texts and symbolic calculi Diagram elements Branding Visual rhetoric Definition of regions |
| Regions | Alignment grids Borders and frames Area fills White space Gestalt integration | Containment Separation Framing (composition, photography) Layering | Identifying shared membership Segregating or nesting multiple surface conventions in panels Accommodating labels, captions or legends |
| Surfaces | The plane Material object on which the marks are imposed (paper, stone) Mounting, orientation and display context Display medium | Literal (map) Euclidean (scale and angle) Metrical (quantitative axes) Juxtaposed or ordered (regions, catalogues) Image-schematic Embodied/situated | Typographic layouts Graphs and charts Relational diagrams Visual interfaces Secondary notations Signs and displays |

https://www.interaction-design.org/encyclopedia/visual_representation.html

Analysis examples

Kyrie eleison (I)

Adagio

The musical score is arranged in a system with the following parts from top to bottom:

- Flauto traverso 1*
- Flauto traverso 2*
- Oboe d'amore 1*
- Oboe d'amore 2*
- Fagotti*
- Violino 1*
- Violino 2*
- Viola*
- SOPRANO 1*
Lyrics: Ky - ri - e, Ky - - ri - e e - - le - - i - son, e - le - - i - son.
- SOPRANO 2*
Lyrics: Ky - ri - e e - - le - - i - son, e - - le - i - son, e - le - - i - son.
- ALTO*
Lyrics: Ky - ri - e e - le - i - son, Ky - ri - e e - le - i - son.
- TENORE*
Lyrics: Ky - ri - e, Ky - ri - e, Ky - ri - e e - le - i - son.
- BASSO*
Lyrics: Ky - ri - e, Ky - - ri - e, Ky - ri - e e - lei - - son.
- Continuo*

At the bottom of the page, there are figured bass notations for the Continuo part: 7 6, 7^b, 6 9 8, 7 6 5, 6 7 6 #.

BASSO

Musical notation for Bass part, two measures of "Ky - ri - e, Ky - - ri - e,". The notation is in bass clef, key of D major (two sharps), and common time (C). The first measure contains a quarter note D4, an eighth note E4, a quarter note F#4, and a quarter rest. The second measure contains a dotted quarter note D4, an eighth note E4, a quarter note F#4, and a quarter rest.

J. S. Bach Chorale number 285 of the Schubert collection,
emulating layout and spacing of the Breitkopf 1990 Edition

Original typesetting by Arild Stenberg



From Sternberg (2018) *Legibility of Musical Scores and Parallels with Language Reading*
Unpublished PhD thesis, Cambridge Centre for Music and Science

J. S. Bach Chorale number 285
Redesigned for performance by Arild Stenberg



| | Graphic Resources | Correspondence | Design Uses |
|----------|---|--|--|
| Marks | Shape | Conventional (arbitrary) | Mark position identify category (shape) |
| Symbols | Geometric elements Letter forms Connective elements | Topological (linking) Acquired (specialist literacies) | Texts Definition of regions |
| Regions | Alignment grids White space | Containment Separation | Segregating and nesting multiple surface conventions in panels Accommodating labels |
| Surfaces | Material object on which the marks are imposed (paper) | Metrical (quantitative axes) Juxtaposed and ordered (regions) | Musical score |



GAPMINDER WORLD

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GLOBAL TRENDS

Wealth & Health of Nations

This graph shows how long people live and how much money they earn. Click the play button to see how countries have developed since 1800.

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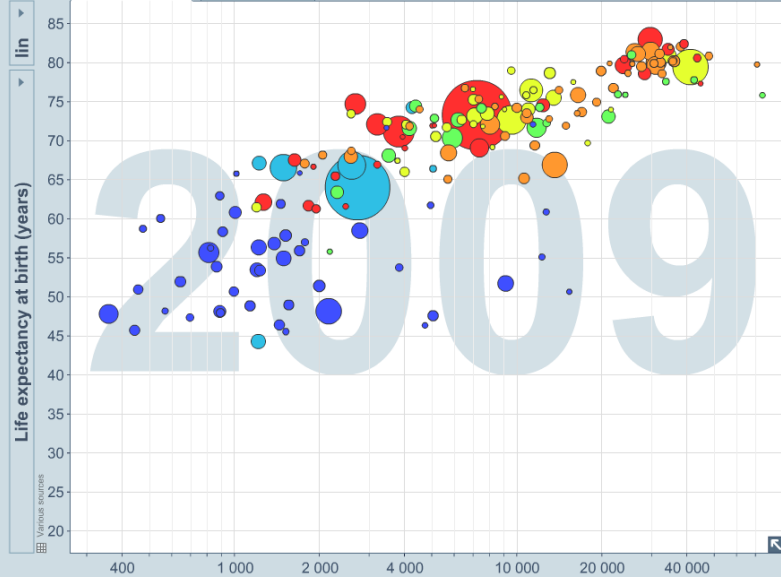
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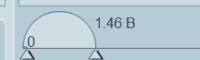


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Size Various sources

Population, total



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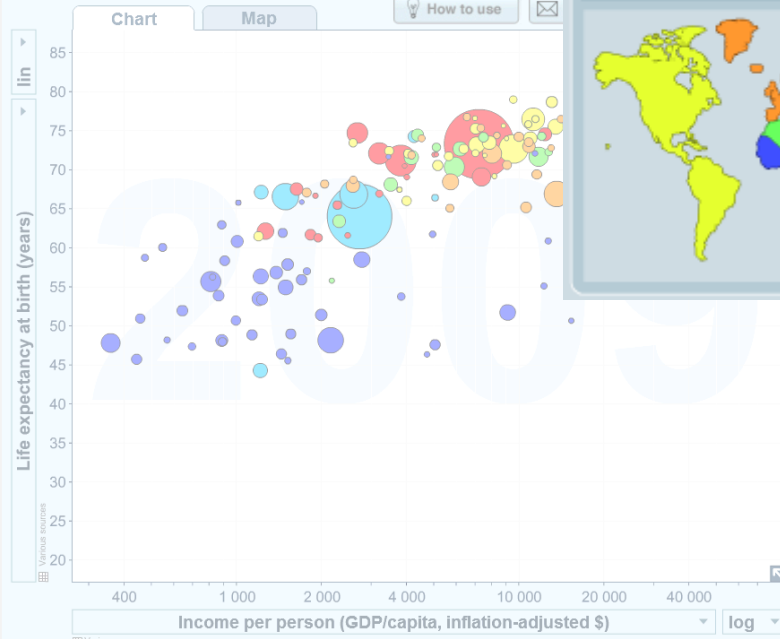
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Size

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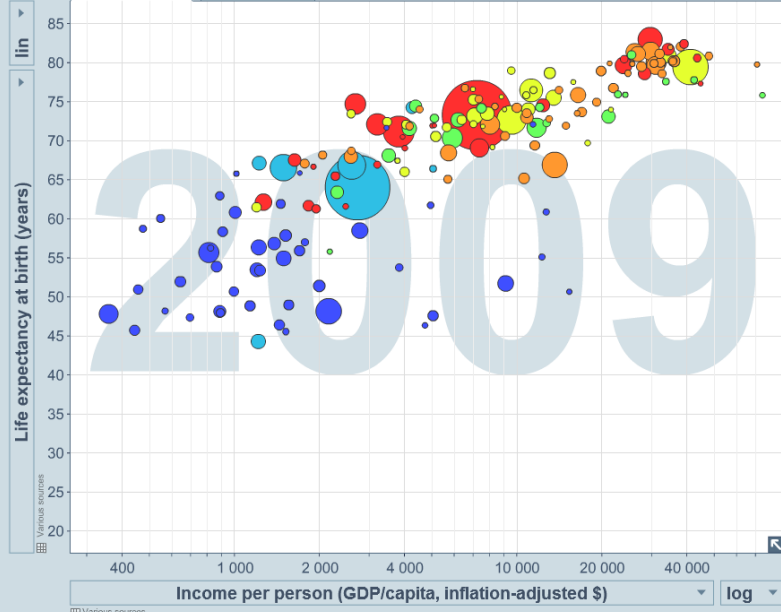
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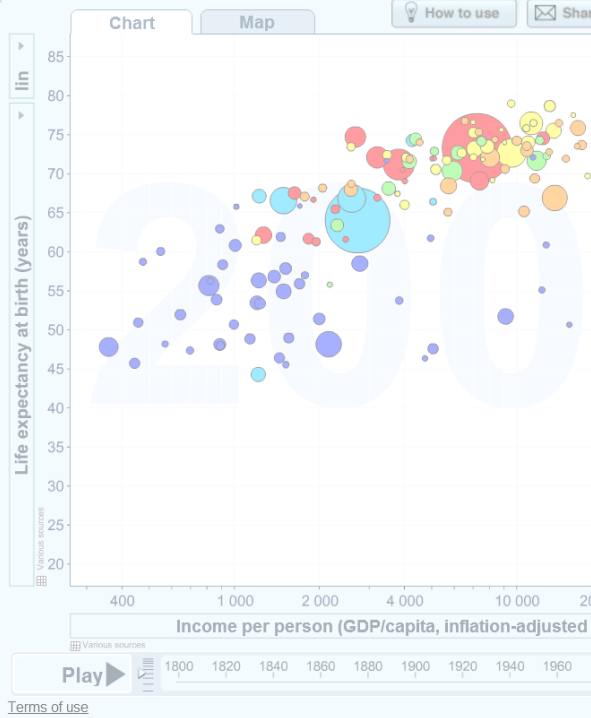
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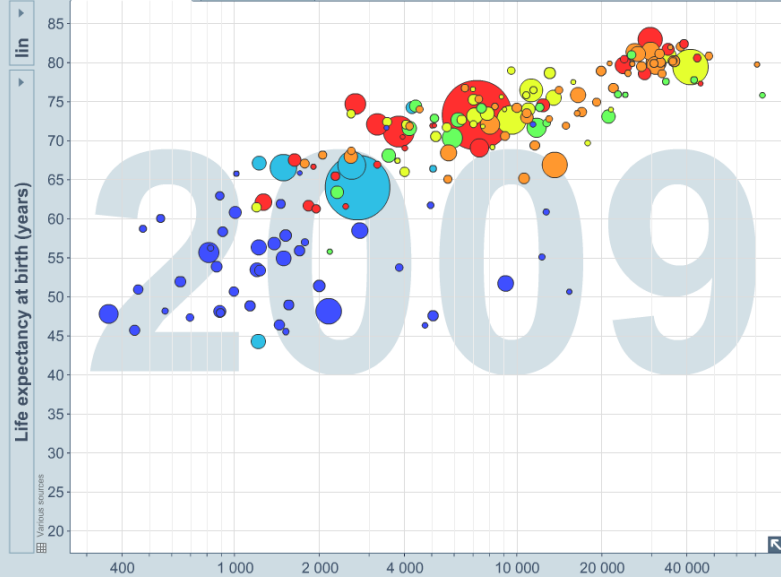
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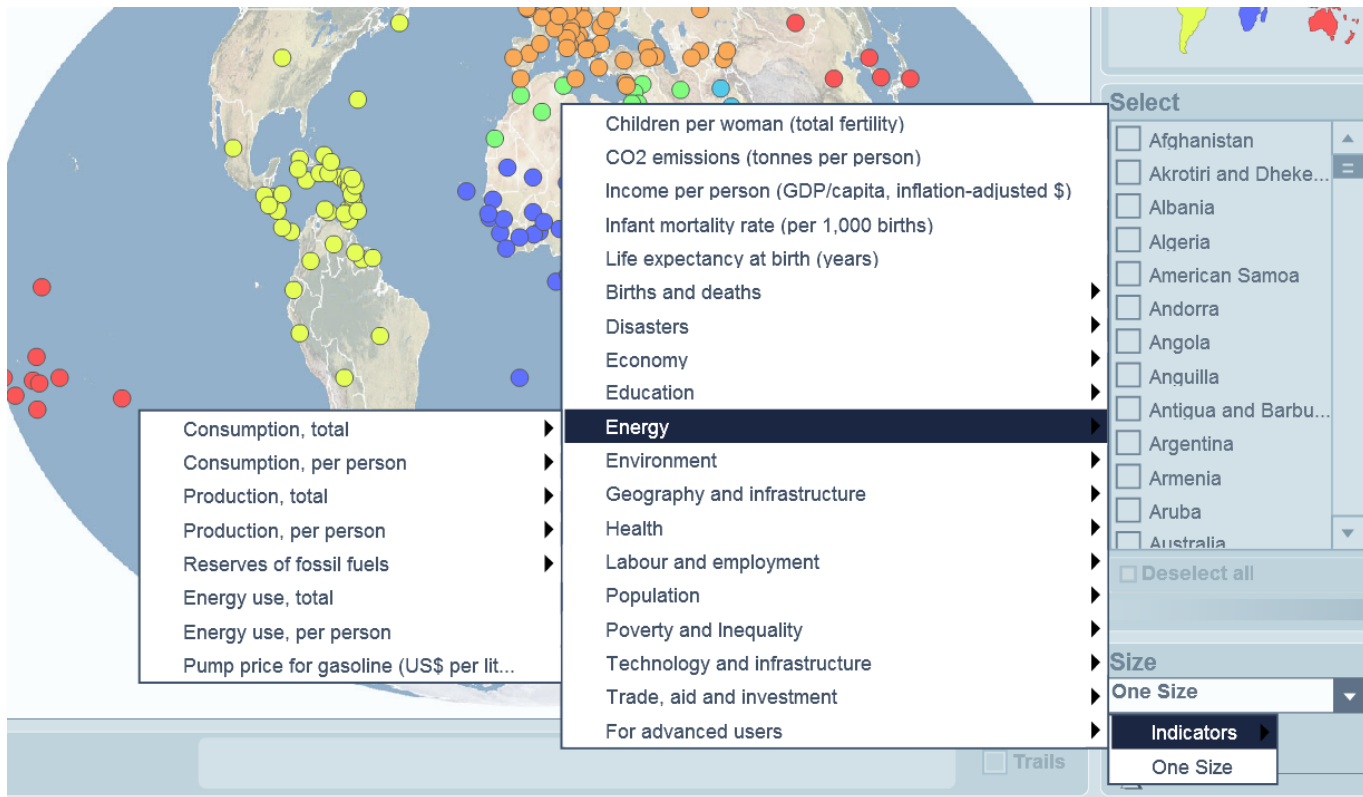
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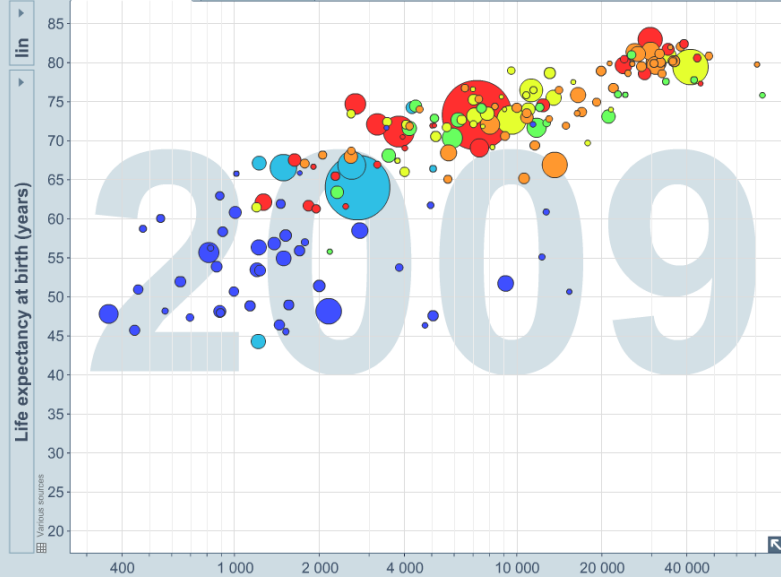
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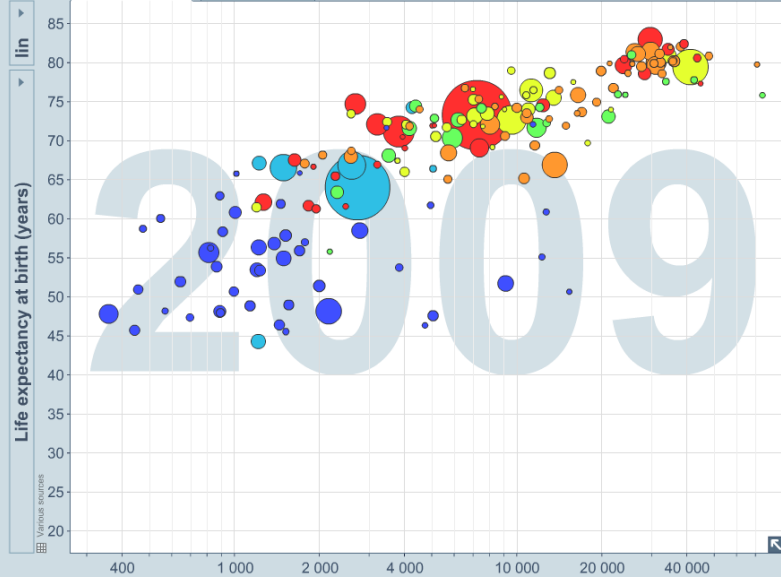
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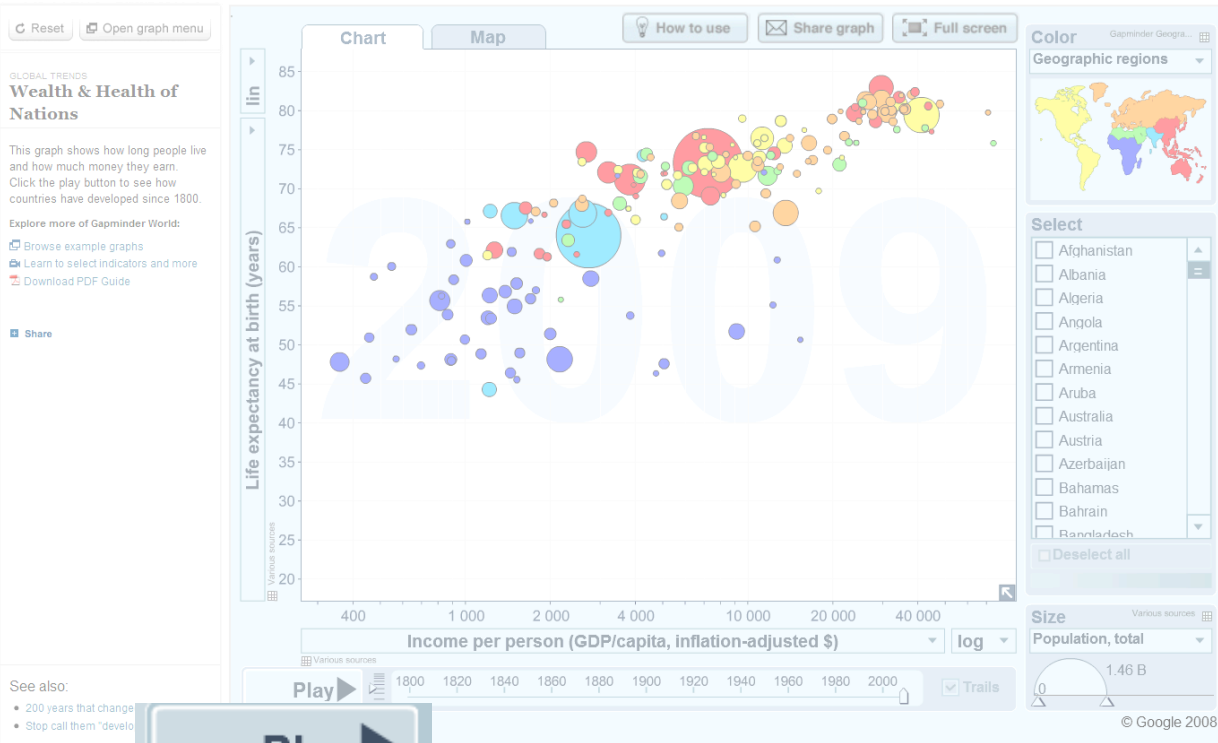
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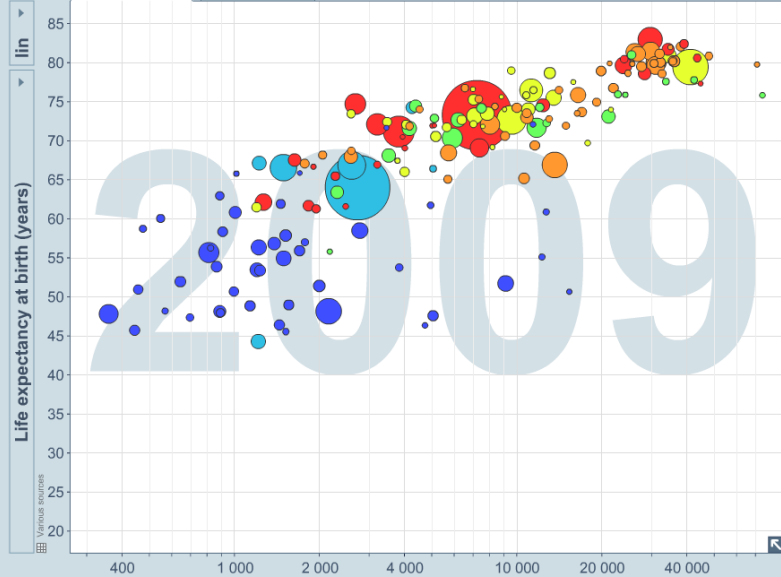
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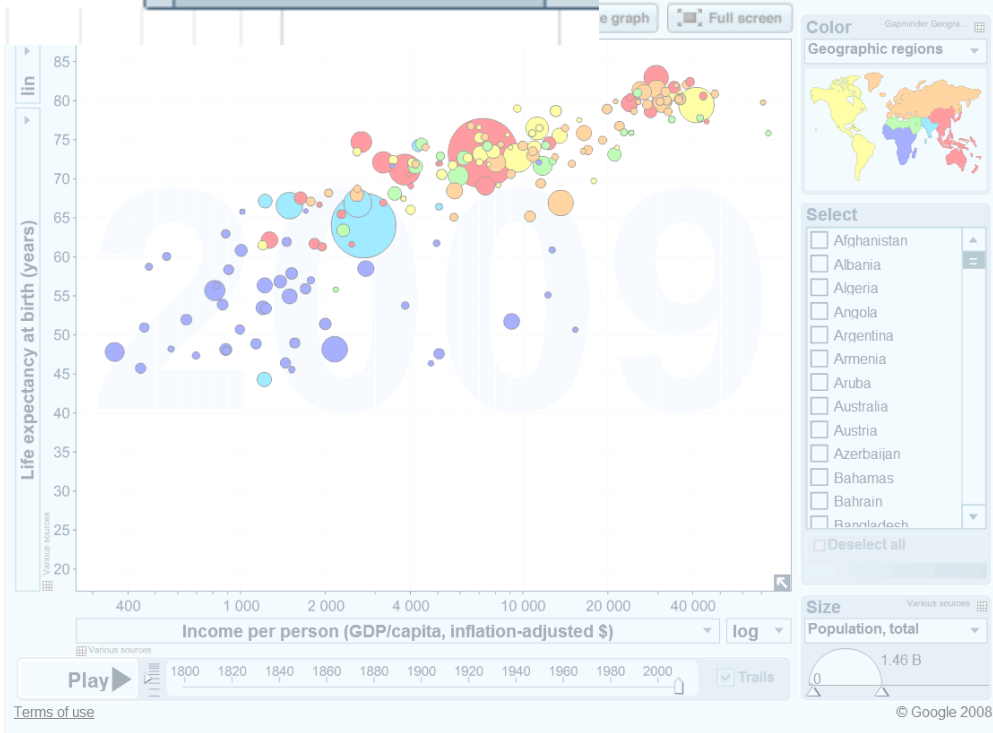
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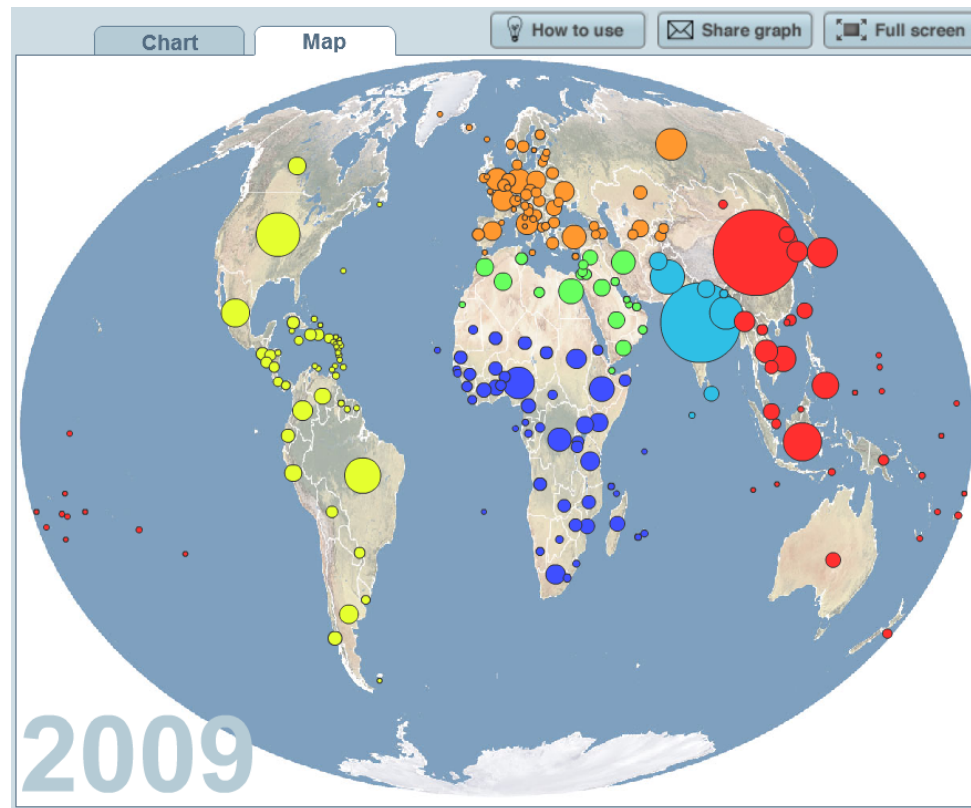
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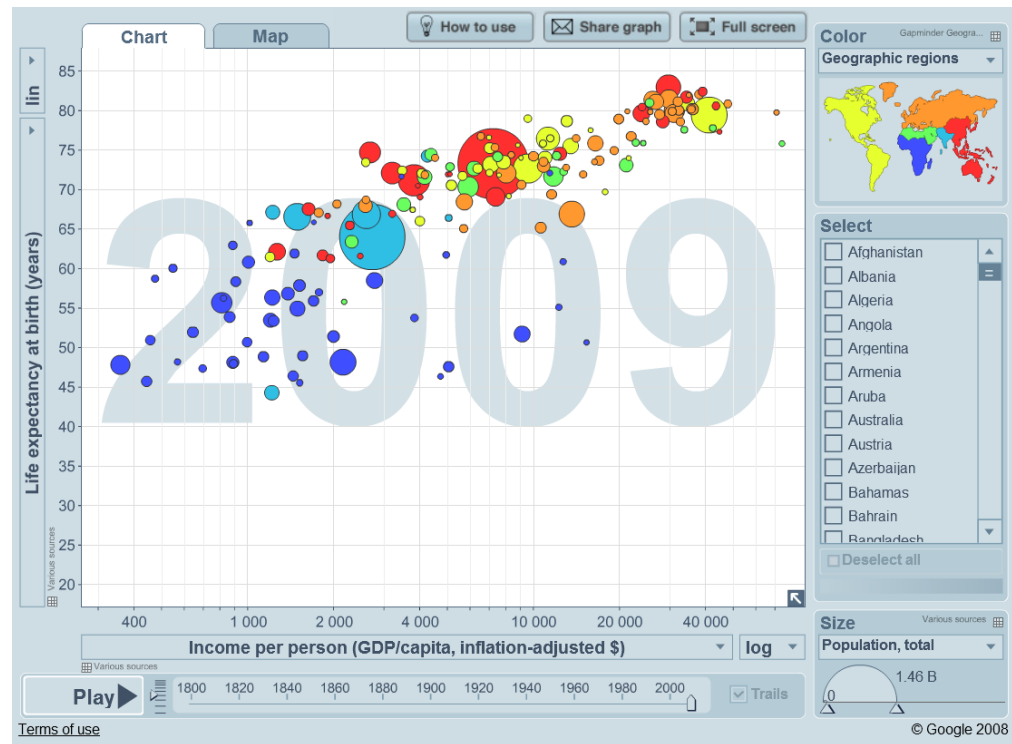
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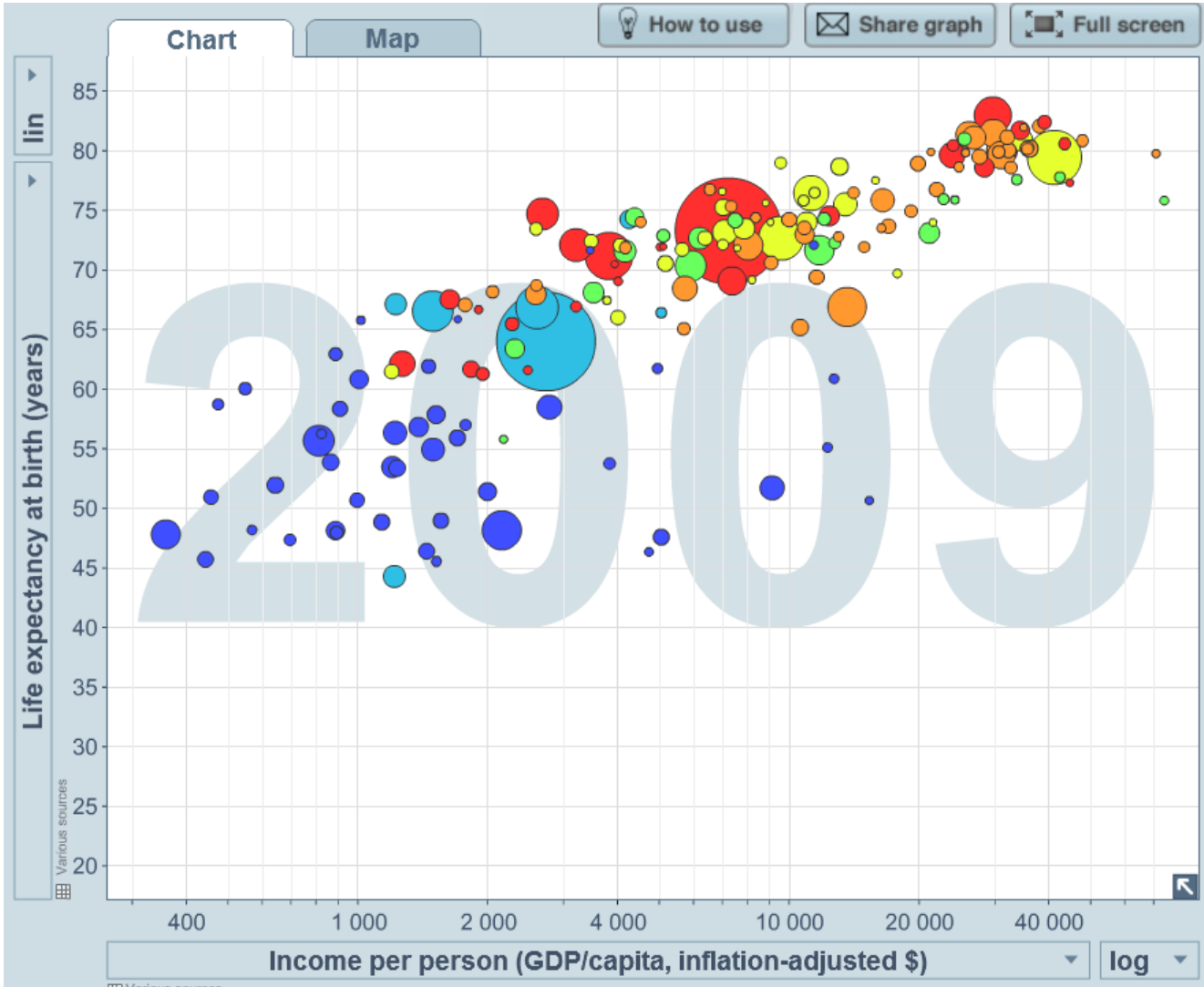
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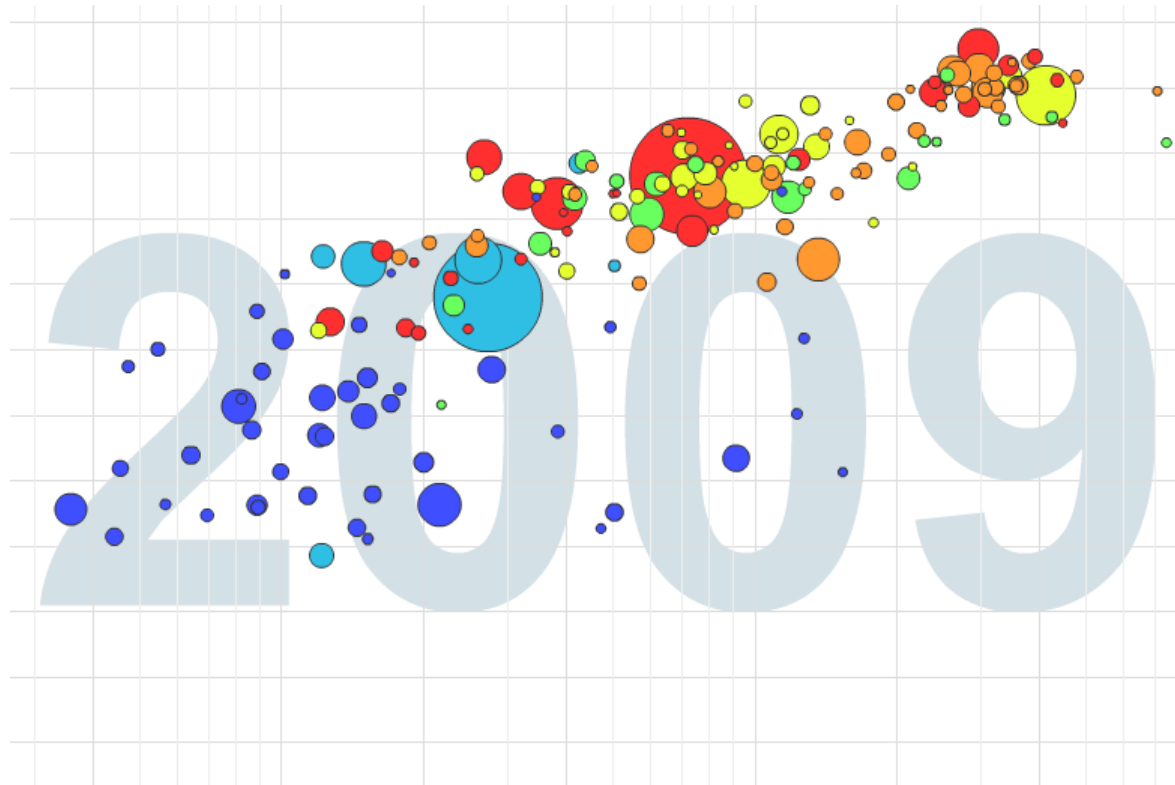
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|----------|---|--|--|
| Marks | Size Colour | Mapping (quantity, relative scale) | Mark position identify category (colour) Express magnitude (size) |
| Symbols | Geometric elements Connective elements | Topological (linking) | Diagram elements Visual rhetoric |
| Regions | Alignment grids | Containment Separation Framing (composition) | Segregating or nesting multiple surface conventions in panels Accommodating labels, captions or legends |
| Surfaces | Display medium (web browser) | Metrical (quantitative axes) Image-schematic? | Graphs and charts |