Corso di Interazione Uomo-Macchina

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Lezione 6: Creatività

Lucidi tradotti e adattati dal materiale presente sul sito http://www.hcibook.com/e3/resources/
e http://www.robertopolillo.it

Corso di Interazione Uomo Macchina
AA 2010-2011

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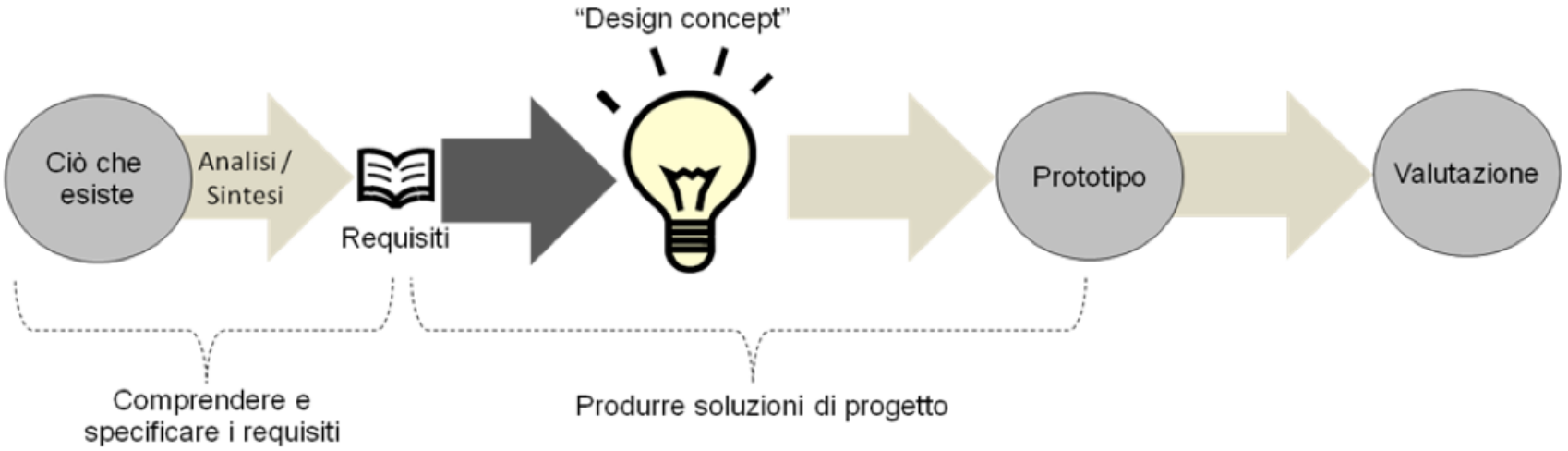
Corso di laurea in Informatica
Università di Milano Bicocca
Dipartimento di Informatica, Sistemistica e Comunicazione

INGEGNERIA E CREATIVITÀ

Edizione 2010-11

Come “inventiamo” nuovi prodotti?



Alcune “tecniche”

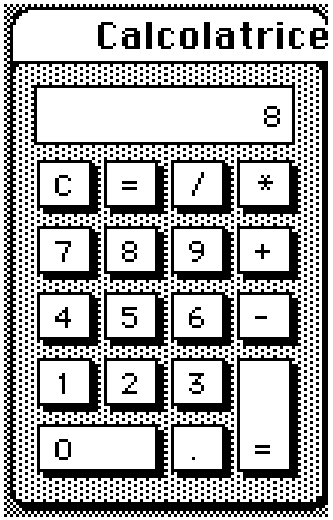
- Mimesi
- Ibridazione
- Metafora
- Variazione
- Composizione

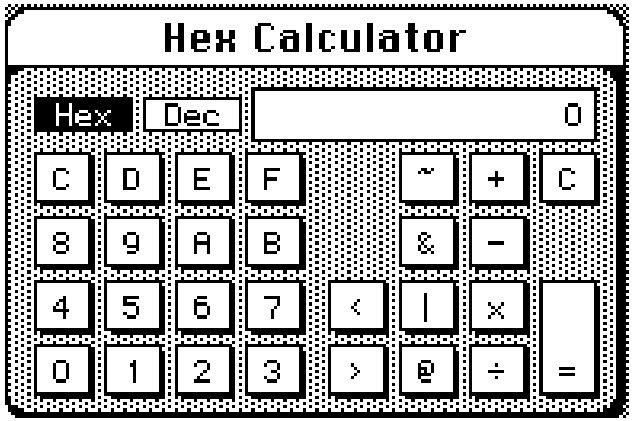
Mimesi

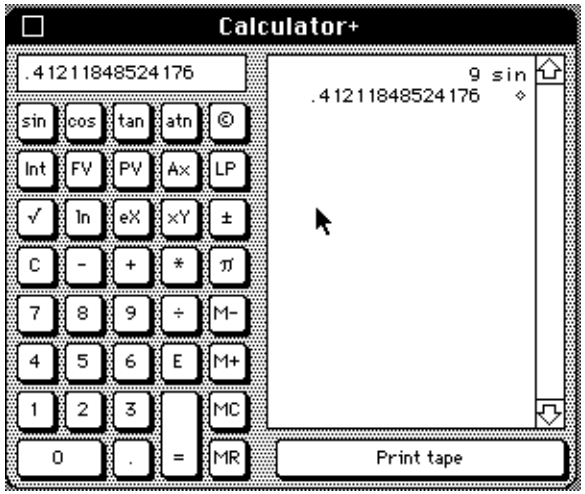
"Imitazione"

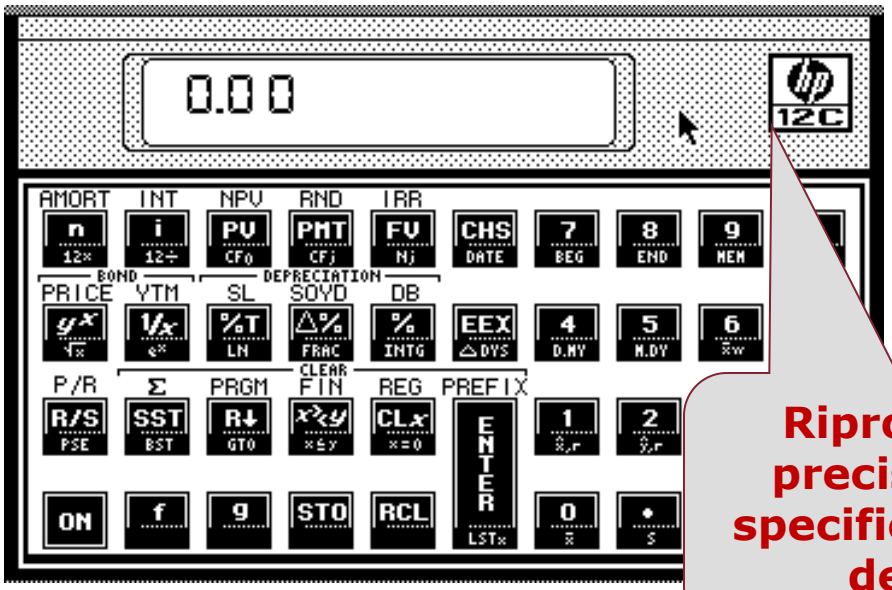
Si costruiscono oggetti virtuali che "riproducono" in ogni dettaglio oggetti reali ampiamente diffusi

Mimesi: esempi









Riproduzione precisa di uno specifico modello dell'HP!


0° N
N
NE
E
SE
S
SO
O
NO
37°19'52" N, 122°1'42" O


VU

548 Card, Robertson, and York

Fig. 5: The WebForager. (See Color Plate 1)

In 1995, Brown described an experimental web browser, called DeckScape [20], that used a metaphor of decks of cards. Although not a book metaphor, it was an alternative way to solve the problem.

All these systems exploit the human perceptual and cognitive systems by using familiar objects, images and affordances. The page turning of a book conveys information about the relationship of pages, the direction you are moving in the book, the size of the book, and the contents of the book. The WebBook takes advantage of advances in graphics and processor power to get much closer to a realistic simulation of a book. At the same time, it goes beyond what is possible with a physical book.

THE WEB FORAGER

The WebBook provides a representation of a more aggregate Web entity, drives the page and allows rapid local interaction with it. The Web Forager allows interaction with multiples of such entities and allows for the necessary tradeoffs among fast access, number of entities, and screen space. The Web Forager is a proposal for a task-tunable information workspace [21] (see Fig. 5).

An individual Web page or a WebBook is presented in a 3D document space (see [12], [23]). Users can click on links in the usual way causing the new linked-to page to fly into the space. The HTML image on the new page develops at the slow literature speeds (often 15–30 sec).

Web pages entered into the space are stored locally and thence forward are available at user interface speeds (around 1–0.1 sec), permitting high interaction rates. These pages can also be grabbed and placed into WebBooks.

Our primary interest in this style of workspace is in exploring the potential for rapid interaction with large numbers of pages. We have previously explored the use of animation, scaling, and 3D-based distortions for building a workspace [21] as a way of handling large numbers of objects. Ark Interface, Inc. [24] produced a pseudo-3D workspace in which functions were associated with parts of a picture of a design studio. Staples [23] did a design mockup study for a 3D user interface. Her goal was to enrich the graphic vocabulary of the workspace by applying perspective, light, and transparency. Butler [22] with co-workers at the MAYA Design Group implemented a 3D design for an office system. Their design is artistically striking and claimed to be able to handle hundreds of documents. We have sought to break new ground relative to their design on several fronts. First, we tried to increase the speed with which objects can be moved around the space by using gestures. Second, we focused on the Web. Third, the WebBook provides a higher-level object. Fourth, we have experimented with observer movement in the space. And Fifth, we have used a structured model for the generation of the design.

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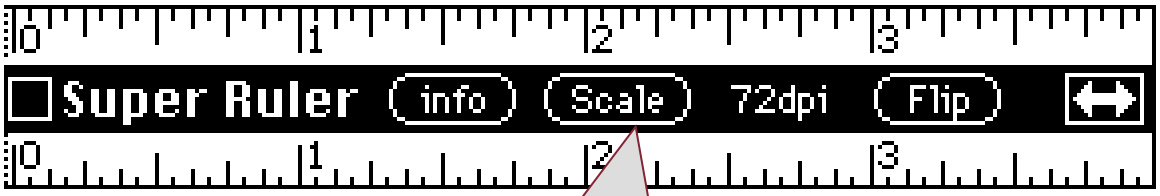
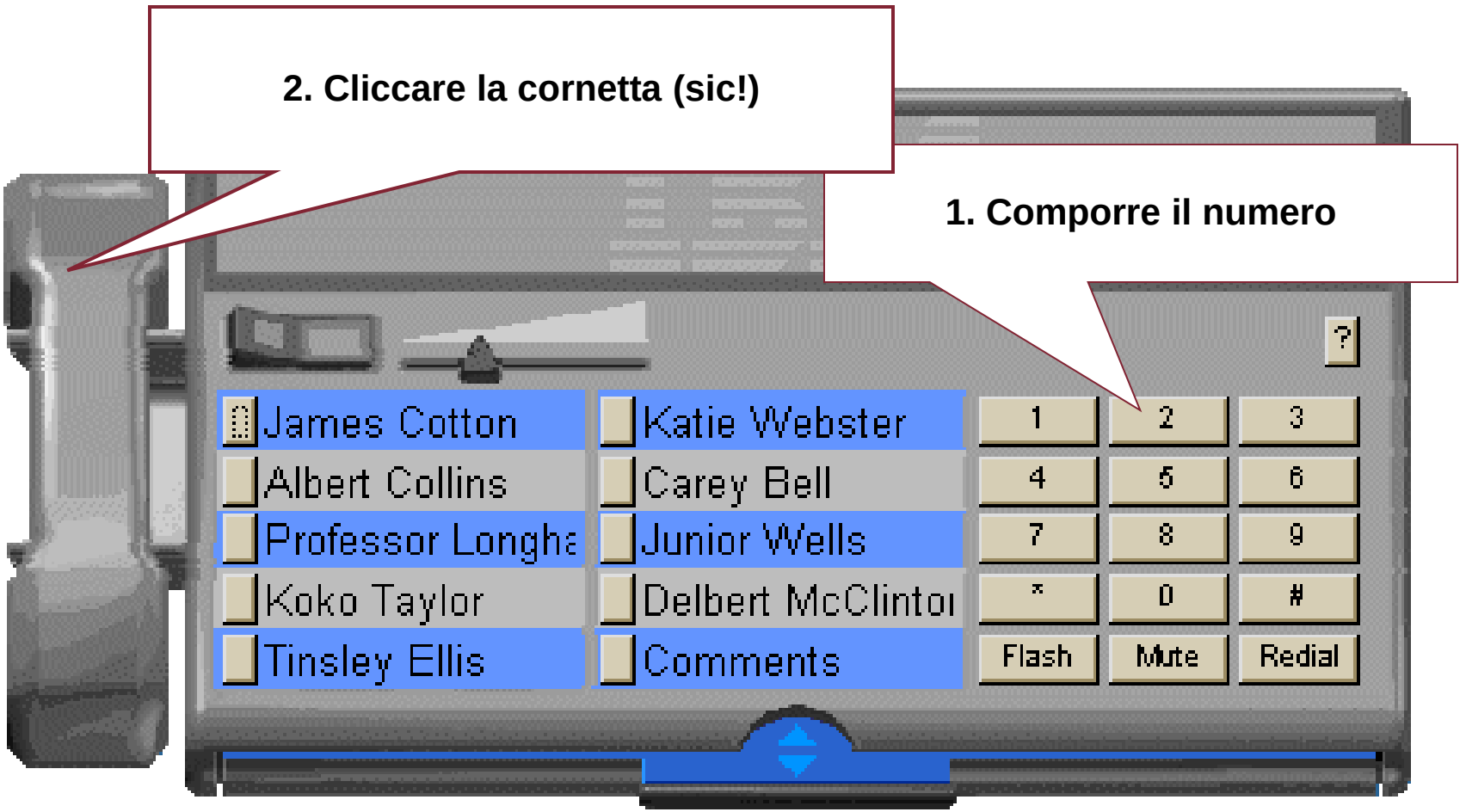
Strumenti digitali

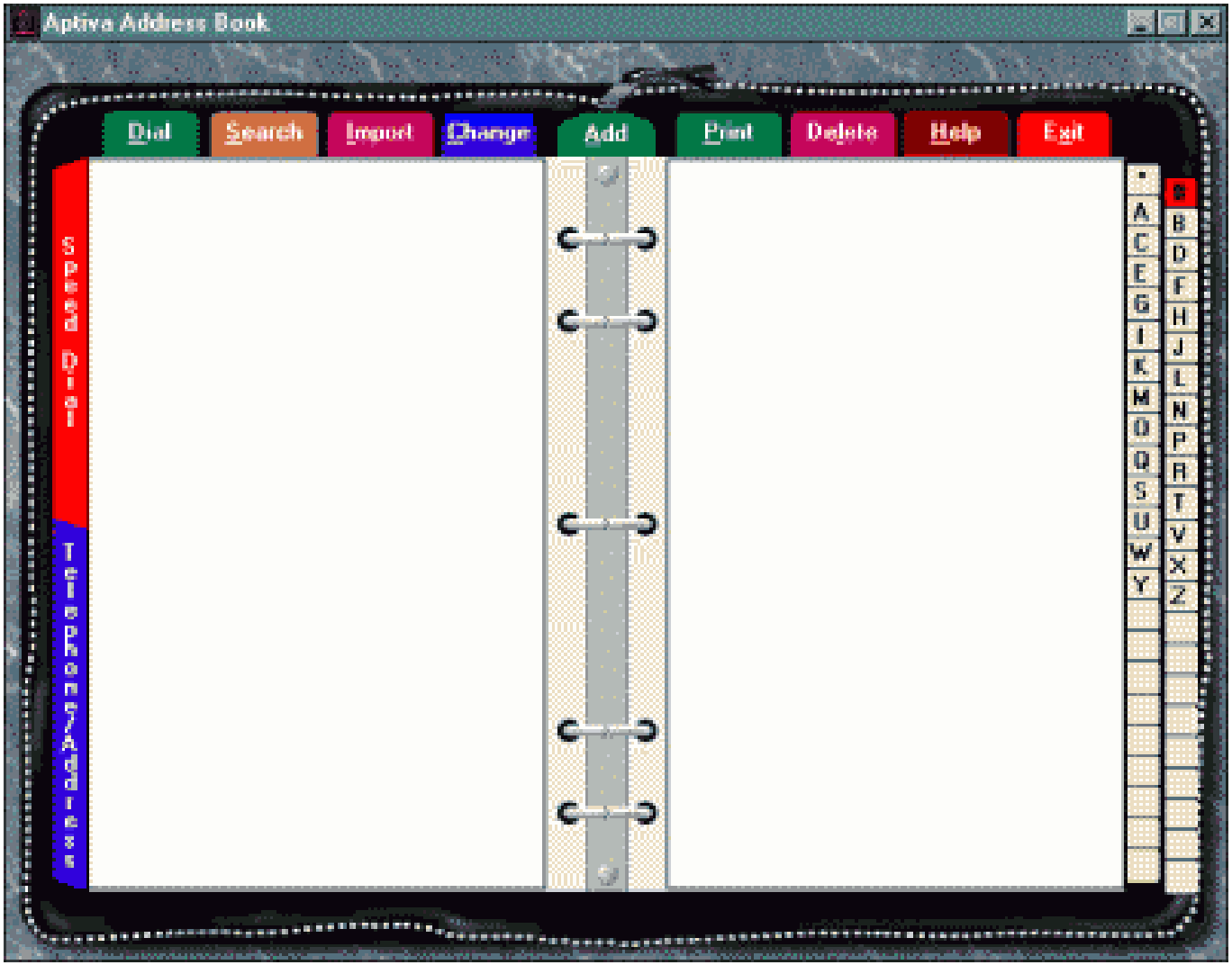


Questo pulsante permette di cambiare scala: oggetto imitato "potenziato" con funzioni non realizzabili nel modello reale

Adeguatezza dell'imitazione



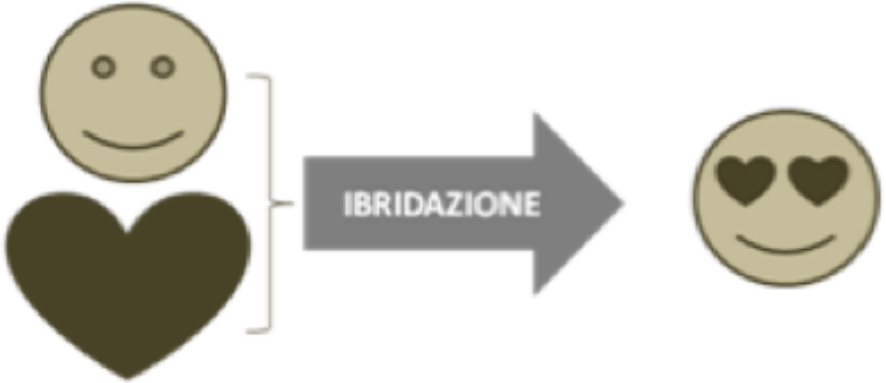
IBM Smart Phone



Da: IBM, *Aptiva Communication Center*

Ibridazione

"Incrociare piante o animali di specie diverse in modo da ottenere ibridi"



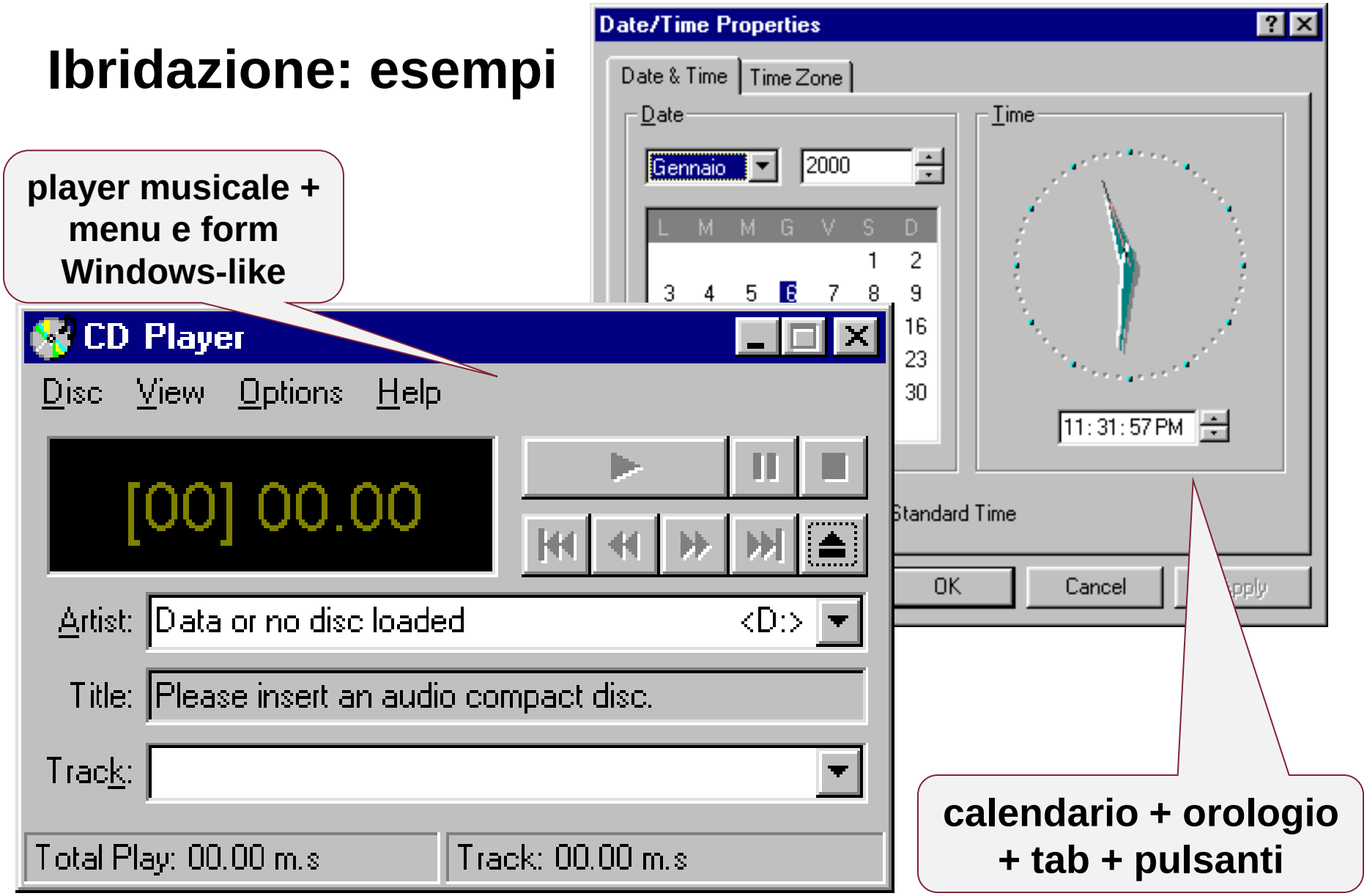
:

lavagna + proiettore $\Rightarrow$ lavagna luminosa

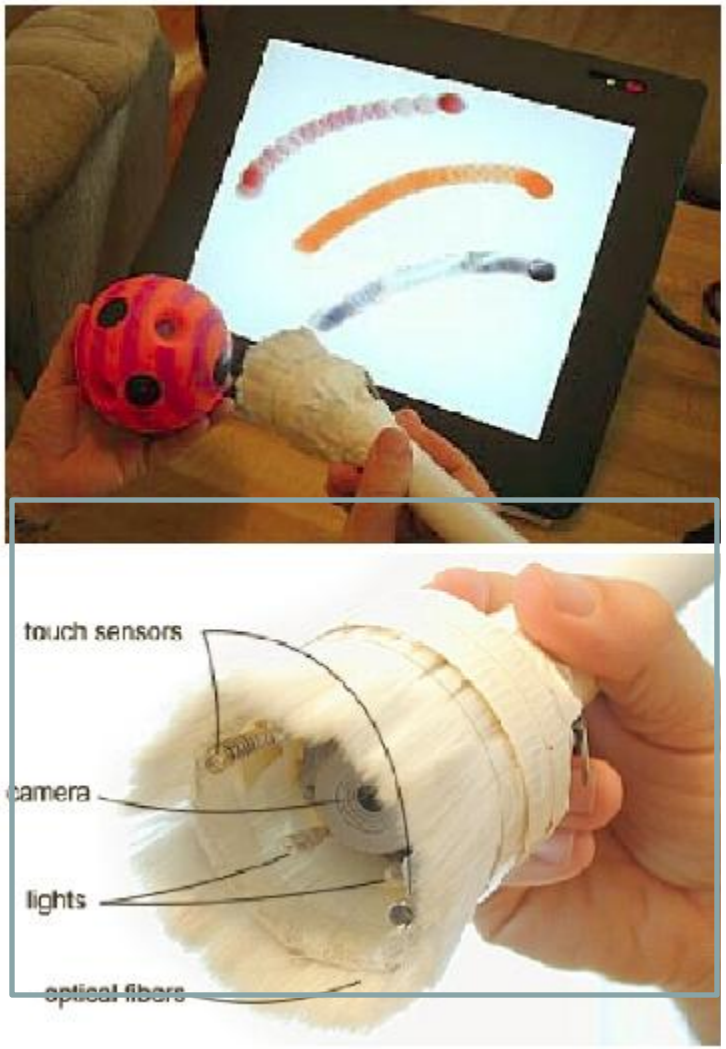
Esempio

Wireless Notebook Presenter Mouse 8000, di Microsoft (2006)

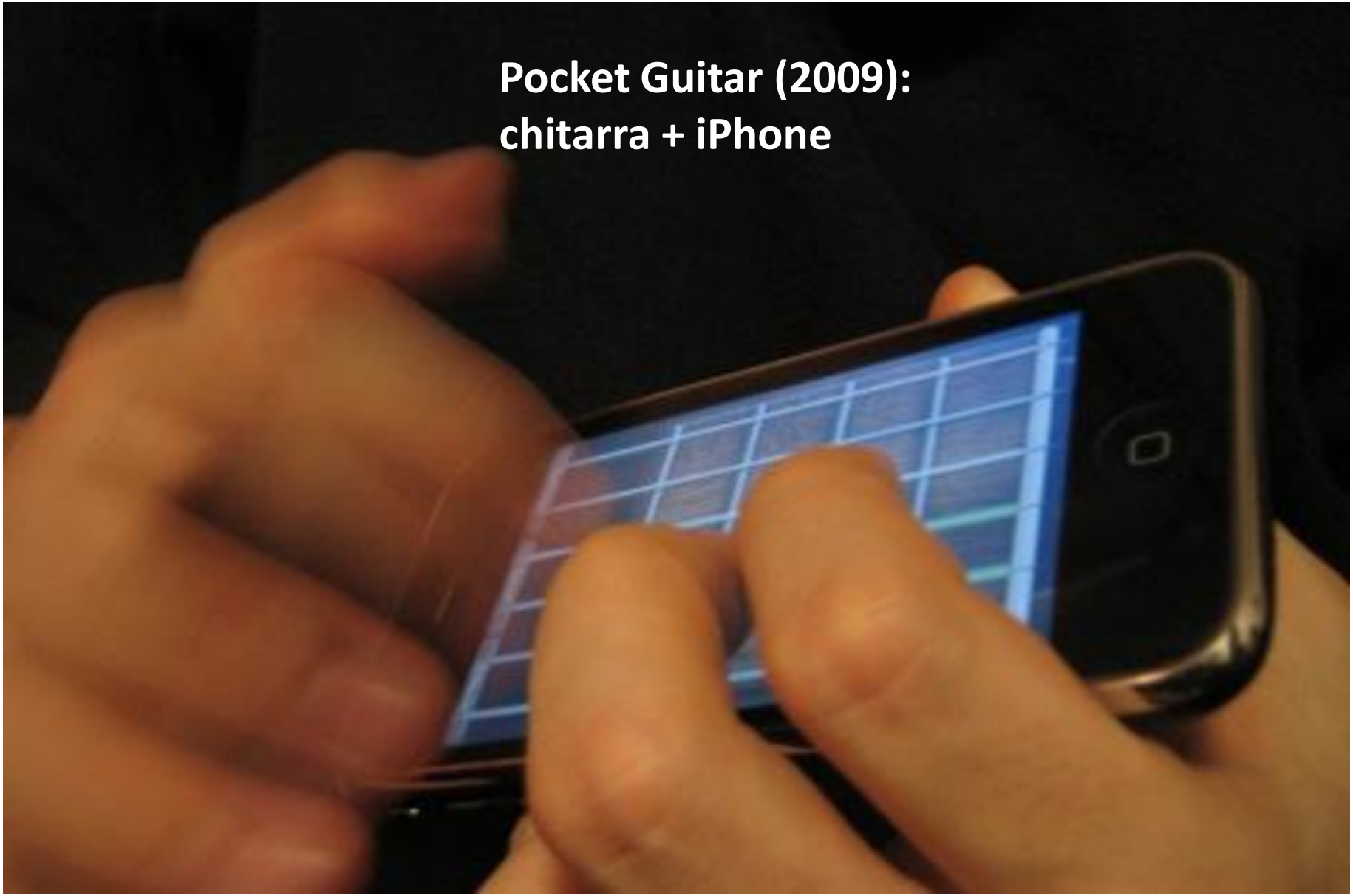
Ibridazione: esempi



I/O Brush (MIT)



http://www.youtube.com/watch?v=lwKPKEt530Y&feature=related


Pocket Guitar (2009):
chitarra + iPhone

Il prototipo Touchbox

- Sviluppato presso nostro Dipartimento
- Sistema operativo montato su processore DSP
- Generazione di interfaccia utente
- Associazione elementi interfaccia con funzionalità DSP
  - Generatori, filtri, distorsori

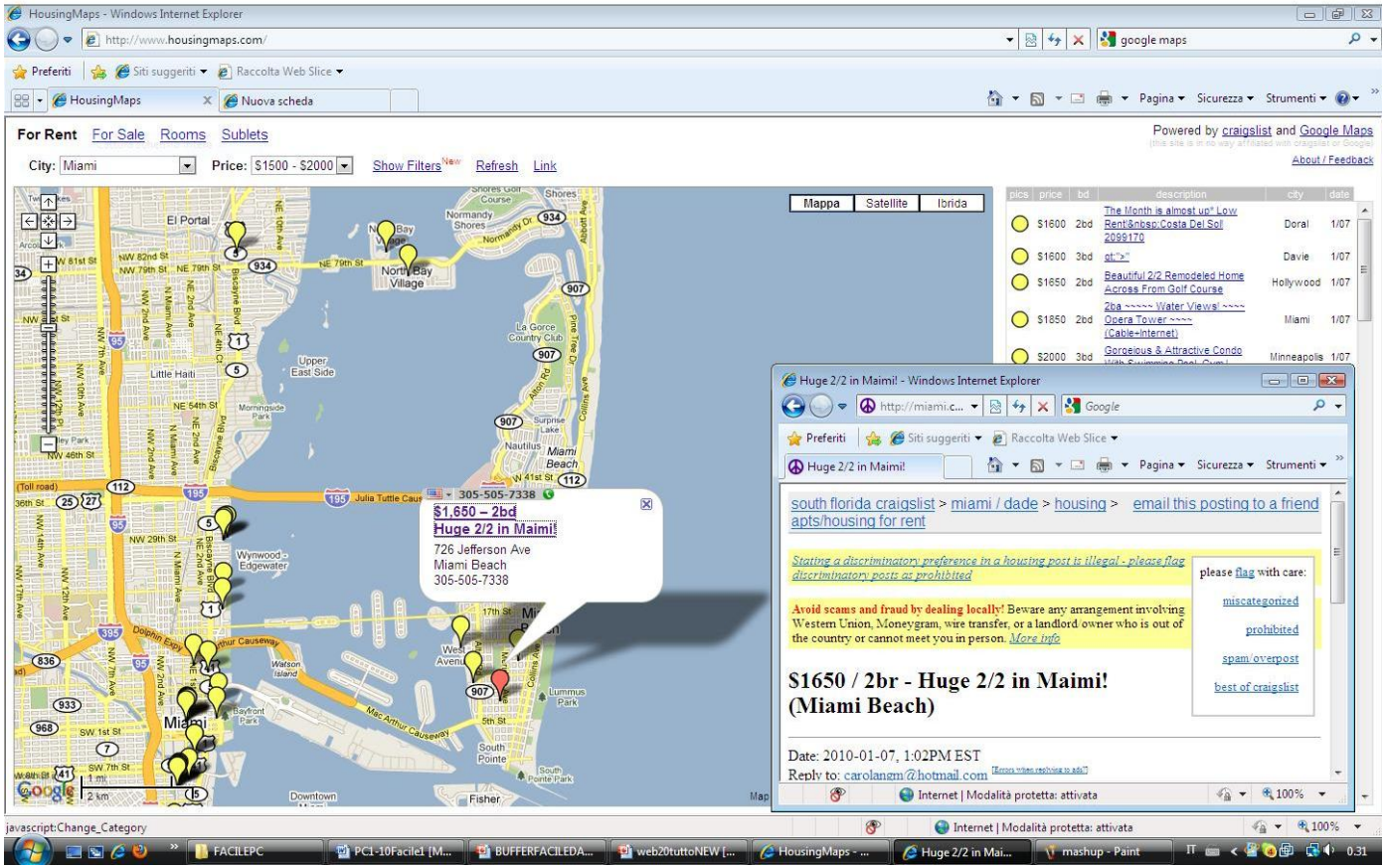
Demo1

Demo2

Altre attività in campo artistico

- Hyperscore
  - Esperienza
  - Dettaglio tecnico
- Virtual Wayang
  - Dalla platea
  - Dietro le quinte

Mashup (googlemaps + craigslist)



http://www.housingmaps.com (2009)

dj3

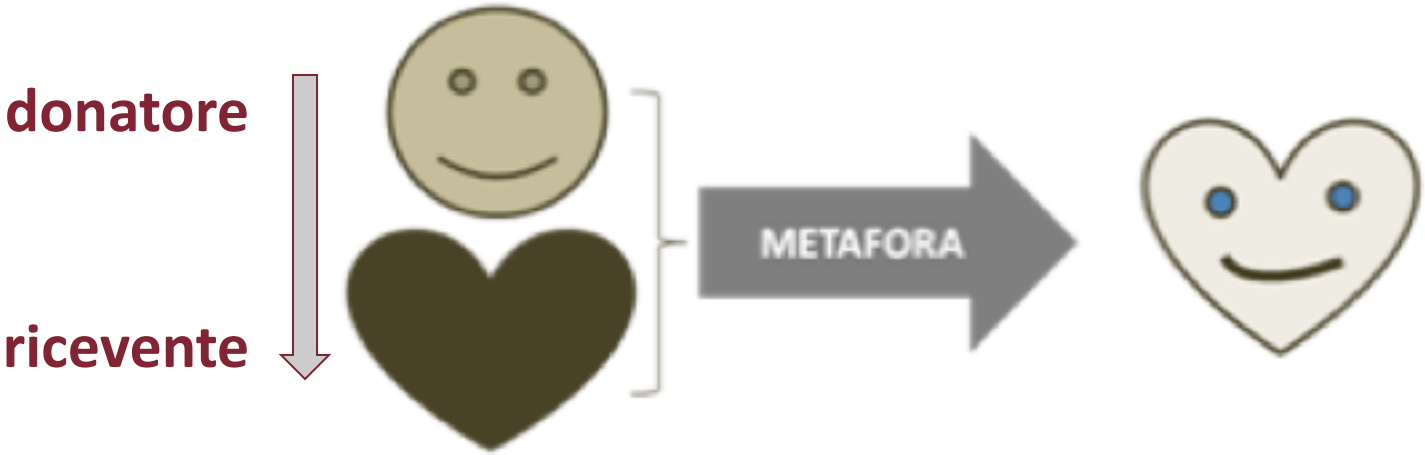

03:05
The Fourtastica
Festivo
-00:46
REC
-03:53
J-Tonic
Hot Rockin Beats
00:41
101 BPM
SYNC
SPEED
148 BPM
SYNC
SPEED
REV
REV
EQ
LOW
MID
HIGH
GAIN
MIXER
GAIN
EQ
LOW
MID
HIGH
FX
Playlists
Library
Podcasts
Purchased
80's Music
90's Music
Name
Artist
BPM
Time
Genre
Dance
DJ Fireredk
100
3:52
Pop
Progressive Chords
Musica Nueba
98
3:26
Jazz
Scratchdoodle
C Tesch
108
4:02
Pop
Block Jam
J-Tonic
92
3:25
Hip-Hop
Doin Your Own Thing
The Fourtastica
107
4:04
Electronic
Trapped
Soul Funk
137
3:33
Pop
Hot Rockin Beats
J-Tonic
133
4:34
Jazz
Pixel Funk
MC Bartelme
89
3:58
Hip-Hop
Budi Bamboocha
The Fourtastica
83
3:58
Electronic
Racoon Riddims
Nallorie Minn
118
4:14
Jazz
Santilo
Fede le Rico
104
4:44
Jazz
Party All Night
J-Tonic
77
4:00
Pop
Turn it up
Riddim Masters
120
4:48
Pop
The Winner Takes It All
The Groovy 7
127
4:55
R&B
Festivo
The Fourtastica
101
3:51
Electronic
Up in the Air
Soul Jadler
120
3:08
Pop
Under Pressure
DJ Mirak
127
3:21
Electronic
Do the Dance
Miss Aural
99
2:27
Hip-Hop
AUTOMIX
Smoking
DJ Mirak
4:22
126 BPM
Turn it up
Riddim Masters
4:48
120 BPM
Dance
DJ Fireredk
3:52
100 BPM


Finder File Edit View Go Window Help
Mon 3:52 PM
Untitled
Save as: Declaration of Independence
Where: Documents
Cancel
Save
We hold these truths to be self-evident, that all
dialogue box + vetro = dialogue box trasparente
Desktop
Back View
Computer Home Favorites Applications
Desktop
Documents
Library
Movies
Music
Pictures
Public
Sites
Downloads
NASA ... report
pathfinder.mov
smitheefamily
pathfinder.mov
Mac OS X

Metafora

dal greco metaphora, trasporto, mutazione

Consiste, in sostanza, nel “mescolare” fra loro campi semantici differenti, trasferendo proprietà e concetti propri di un campo semantico ad un altro



Metafora: esempi

- sei un fulmine
- l’ondeggiare delle spighe
- il ruggire dei motori
- la gamba del tavolo
- al timone dello stato

Metafora: esempio

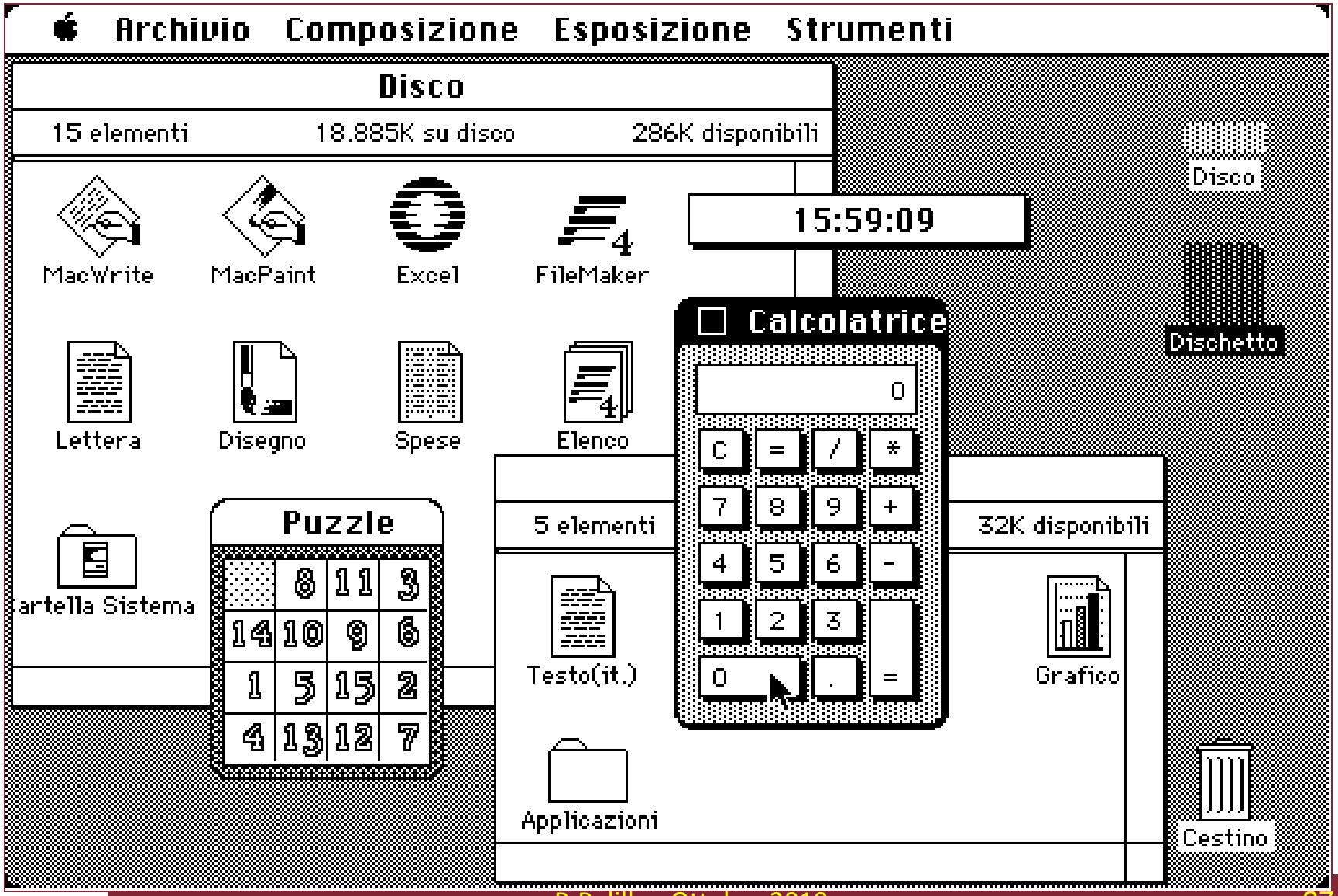
È vero, il mondo è tutto un palcoscenico
sul quale tutti noi, uomini e donne
siam solo attori, con le nostre uscite
e con le nostre entrate; ove ciascuno,
per il tempo che gli è stato assegnato,
recita molte parti,
e gli atti sono le sue sette età
….

W. Shakespeare, As you like it

La icona crea la metafora, e suggerisce immediatamente la funzione del menu

Word 95

La metafora della scrivania (Macintosh, 1984)



(http://www.jkrowling.com/it, 2009)

Due metafore sull'aritmetica

- Metafora della collezione
  - Collections of objects of the same size → Numbers;
  - The size of the collection → The size of the number;
  - Bigger → Greater; Smaller → Less;
  - The smallest collection → The unit;
  - Putting collections together → Addition;
  - Taking a smaller collection from a larger collection → Subtraction
- Metafora del cammino
  - Acts of moving along a path → Arithmetic operations;
  - A point-location on the path → The result of an arithmetic operation;
  - The origin, the beginning of the path → Zero;
  - Point-locations on a path → Numbers;
  - The unit location, a point location distinct from the origin → One;
  - Further from the origin than → Greater than; Closer to the origin than → Less than;
  - Moving from a point-location A away from the origin, a distance that is the same as the distance from the origin to a point-location B → Addition of B to A;
  - Moving toward the origin from A, a distance that is the same as the distance from the origin to B → subtraction of B from A.

Metafora: vantaggi

Suggerisce idee a designer, perché trasferisce intero “campo semantico” fra contesti, suggerendo soluzioni inattese

Esempi:

la gamba del tavolo → Mettere giarrettiera a gamba? Mettere scarpe?

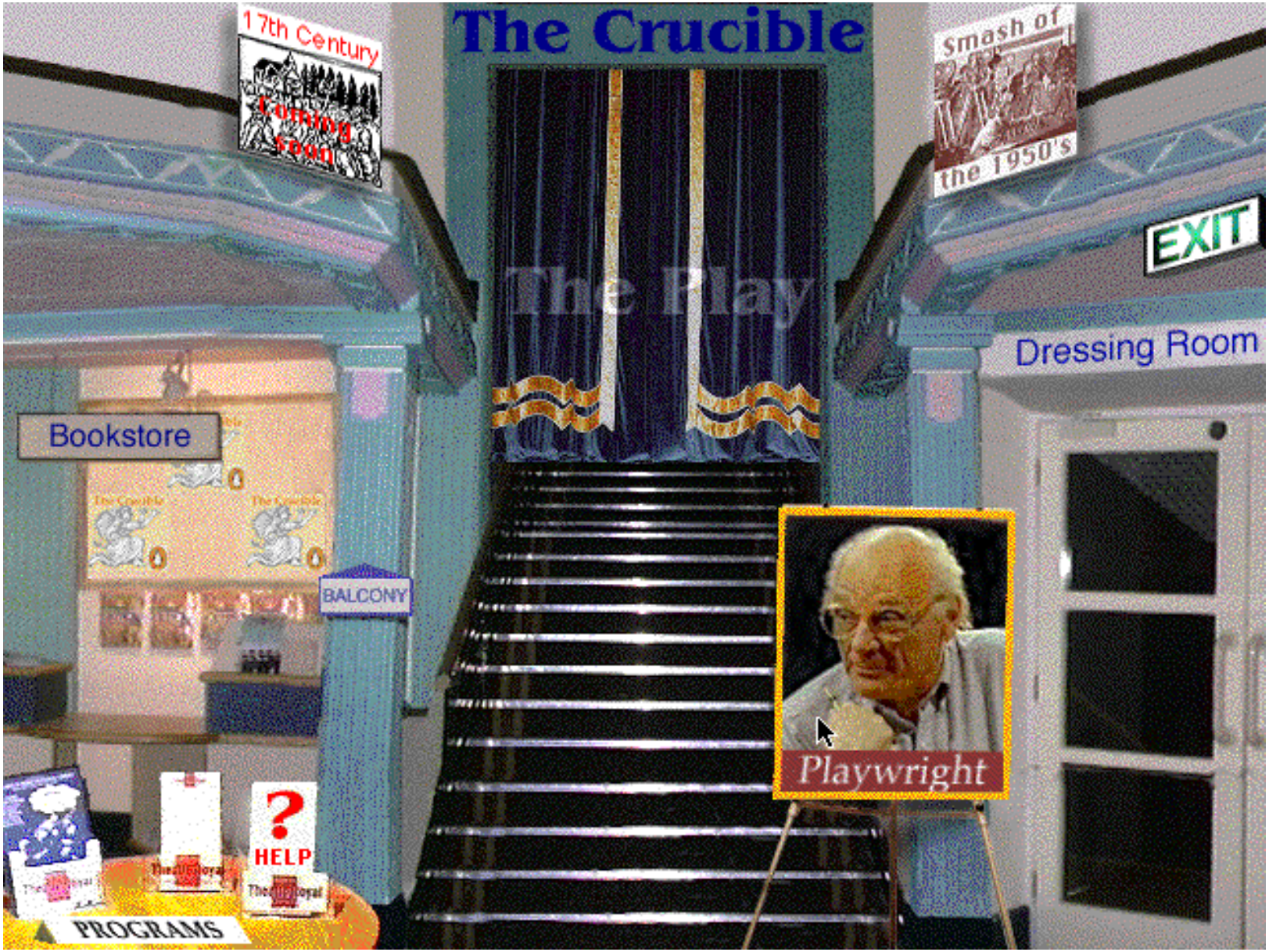
il ruggire del motore → “Metti un tigre nel motore”

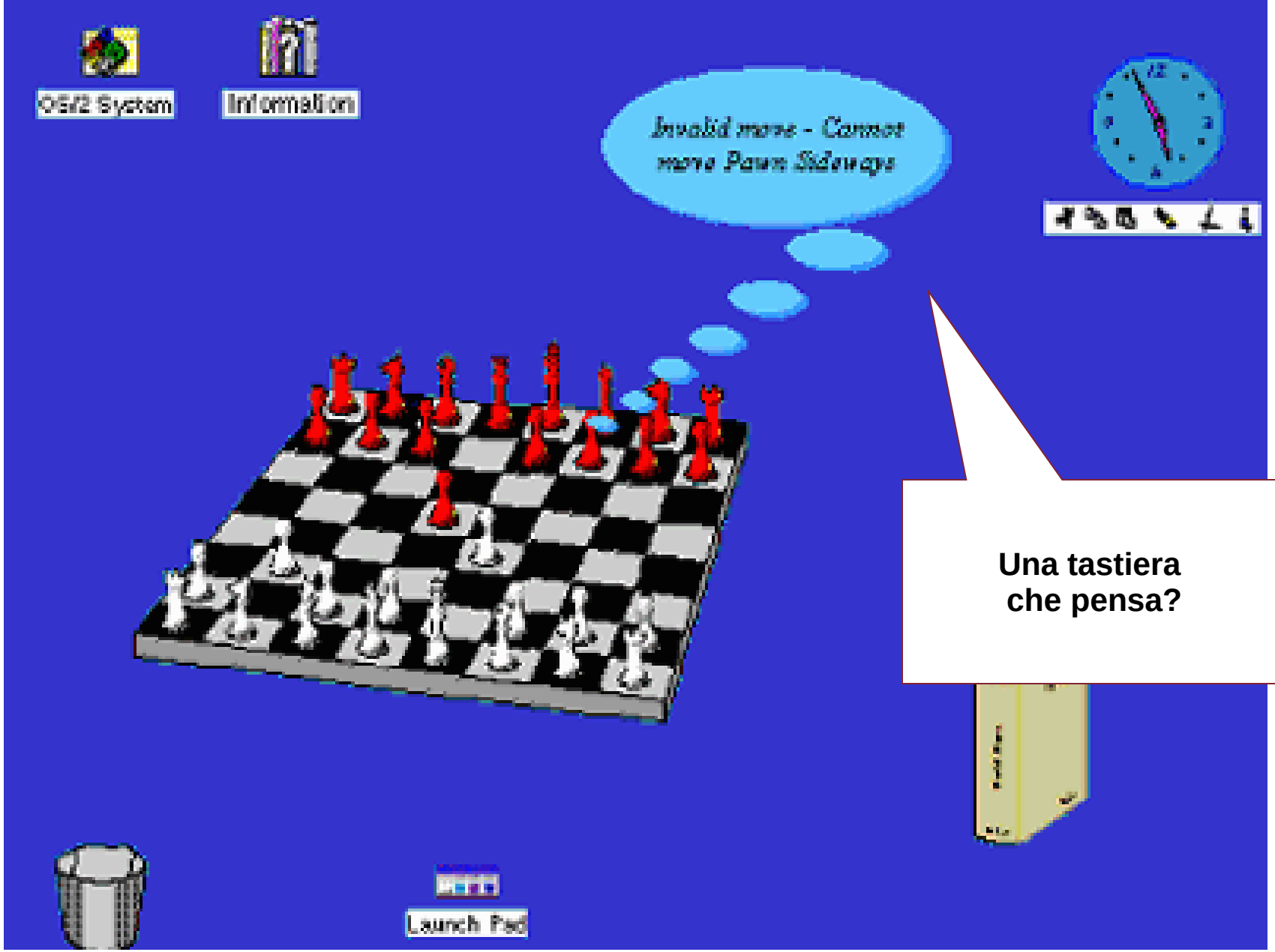
Metafora: svantaggi

Confusione utente: incongruenze fra due campi semantici possono generare confusione e sfiducia

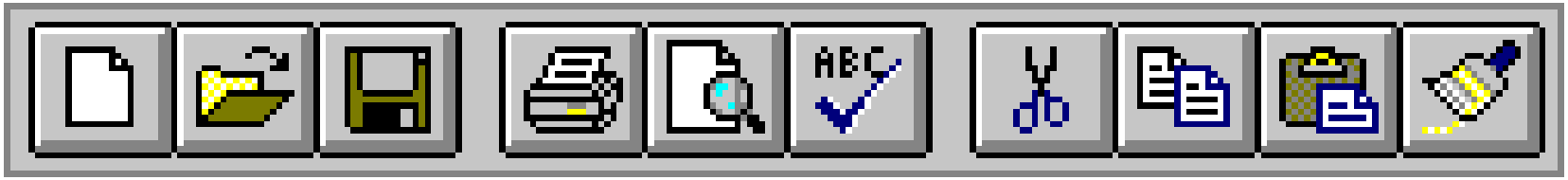
NB. Metafora non è similitudine!


Melbourne Airport Website - Microsoft Internet Explorer
File Edit View Go Favorites Help
Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen Mail Print Edit
Address http://www.mel.com.au/pub/homepage.html
Links Best of the Web Channel Guide Customize Links Internet Explorer News Internet Start RealPlayer
the 1999 Australian Airport of the Year Award and the 1999 Victorian Tourism A
MELBOURNE AIRPORT
CHOICE • COMFORT • CONVENIENCE
Services
Flight Info
Departures
Arrivals
Transport
Passenger Information
WINNER 1998 AUSTRALIAN TOURISM AWARD
GENERAL TOURISM SERVICES AWARDS
information desk
Dining
Shops
Hotels Motels
Feed Back
Media Info
Help
Information
Liability Disclaimer
© 1997 Melbourne Airport
Internet zone


The Crucible
17th Century
Coming Soon
Smash of
the 1950's
EXIT
The Play
Dressing Room
Bookstore
BALCONY
Playwright
?
HELP
PROGRAMS

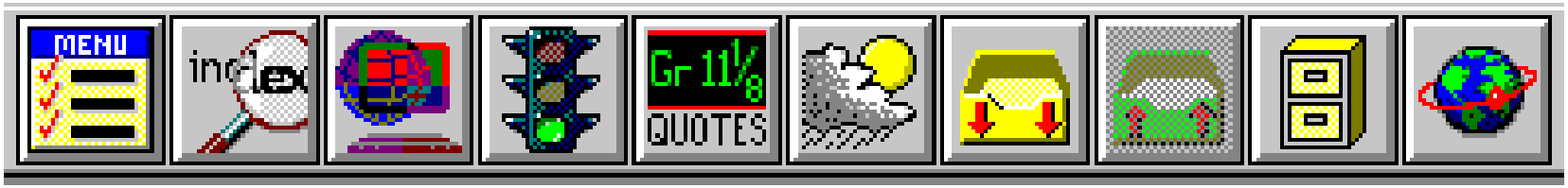

OS/2 System
Information
Invalid move - Cannot move Pawn Sideways
Una tastiera che pensa?
Launch Pad

Il design delle icone



Windows

Mac OS X

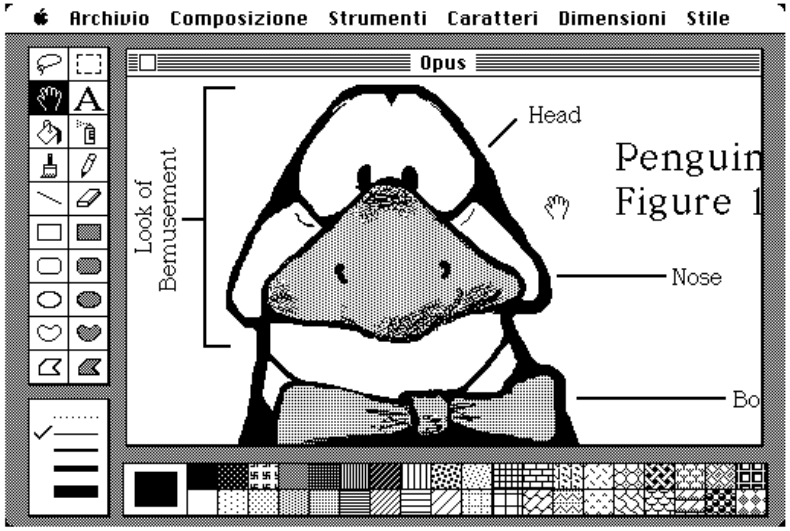


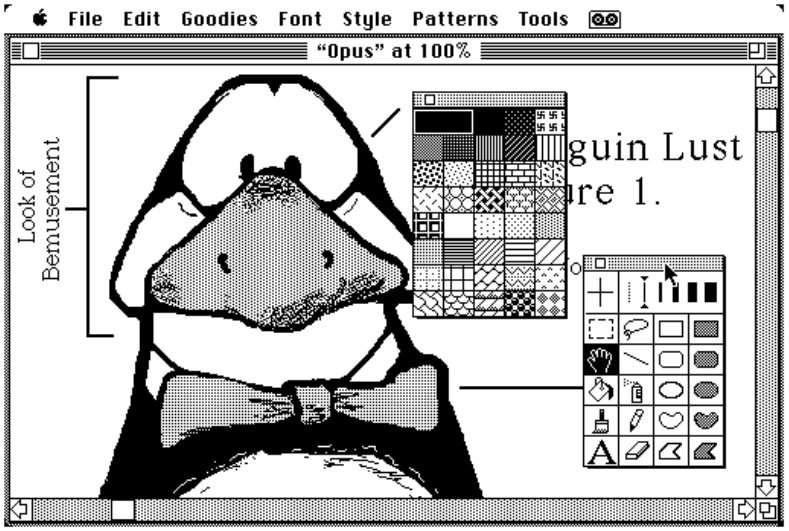
? ? ? ? ?

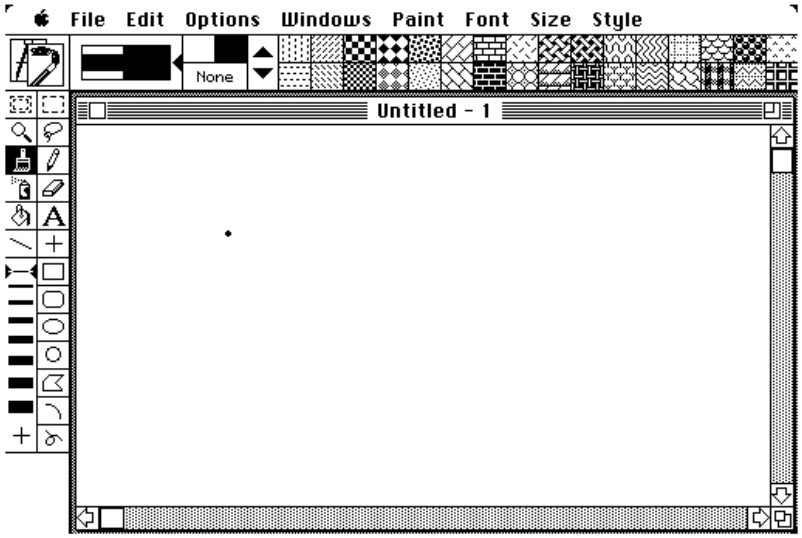

3G
0:00
100%
Messages
Wednesday
17
Calendar
Photos
Camera
YouTube
Stocks
280
Maps
73°
Weather
Voice Memos
Notes
Clock
Calculator
Settings
iTunes
App Store
Compass
Phone
Mail
Safari
iPod

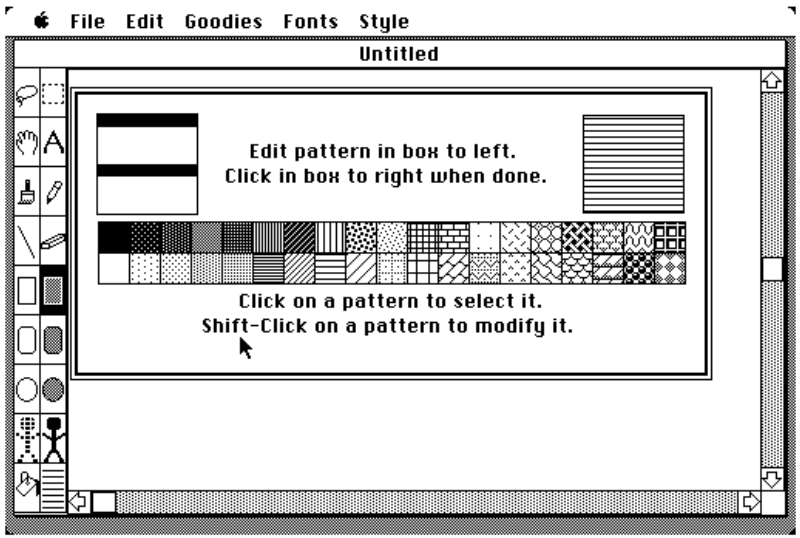
Variazione

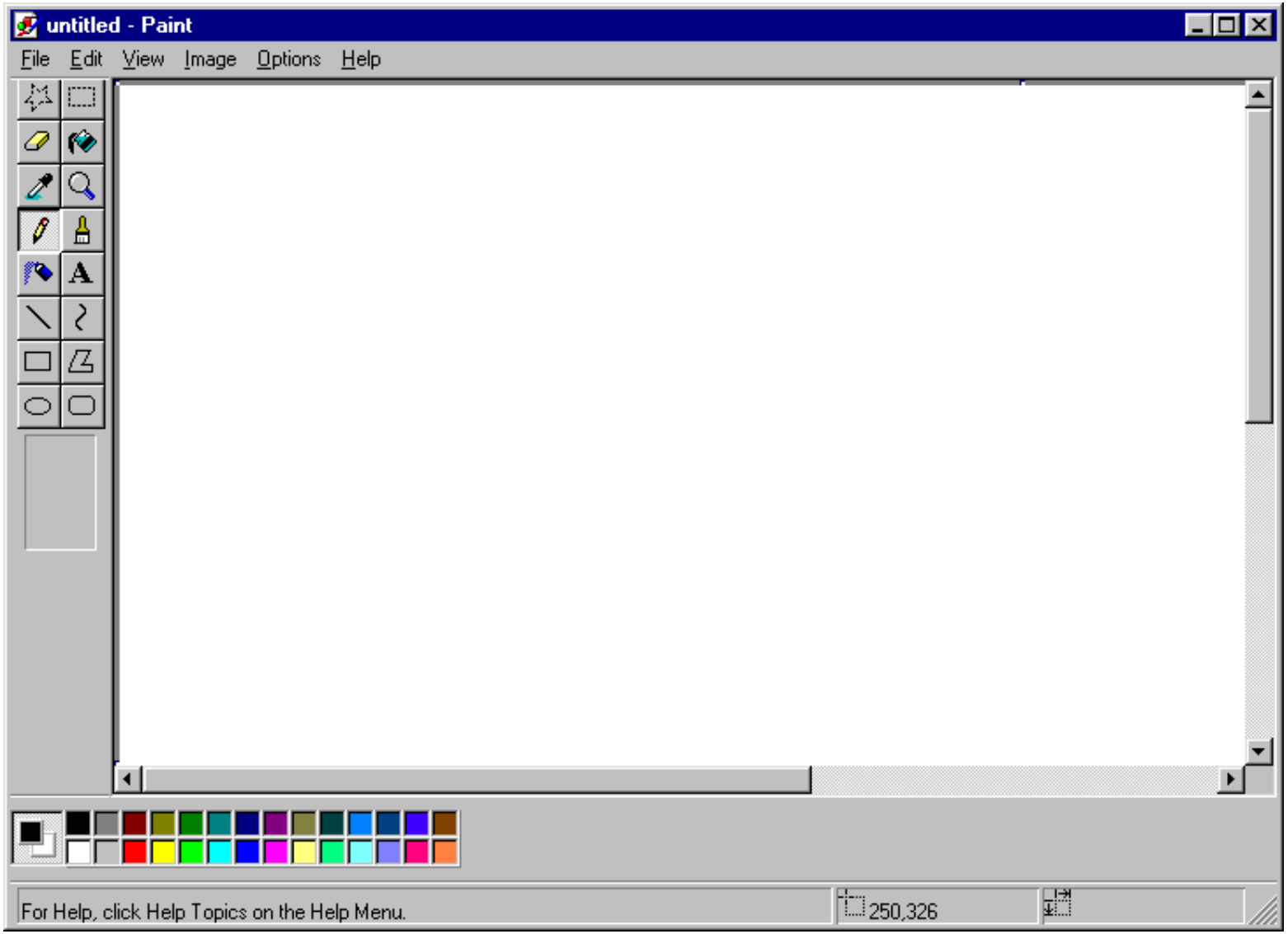
Variazione: esempi



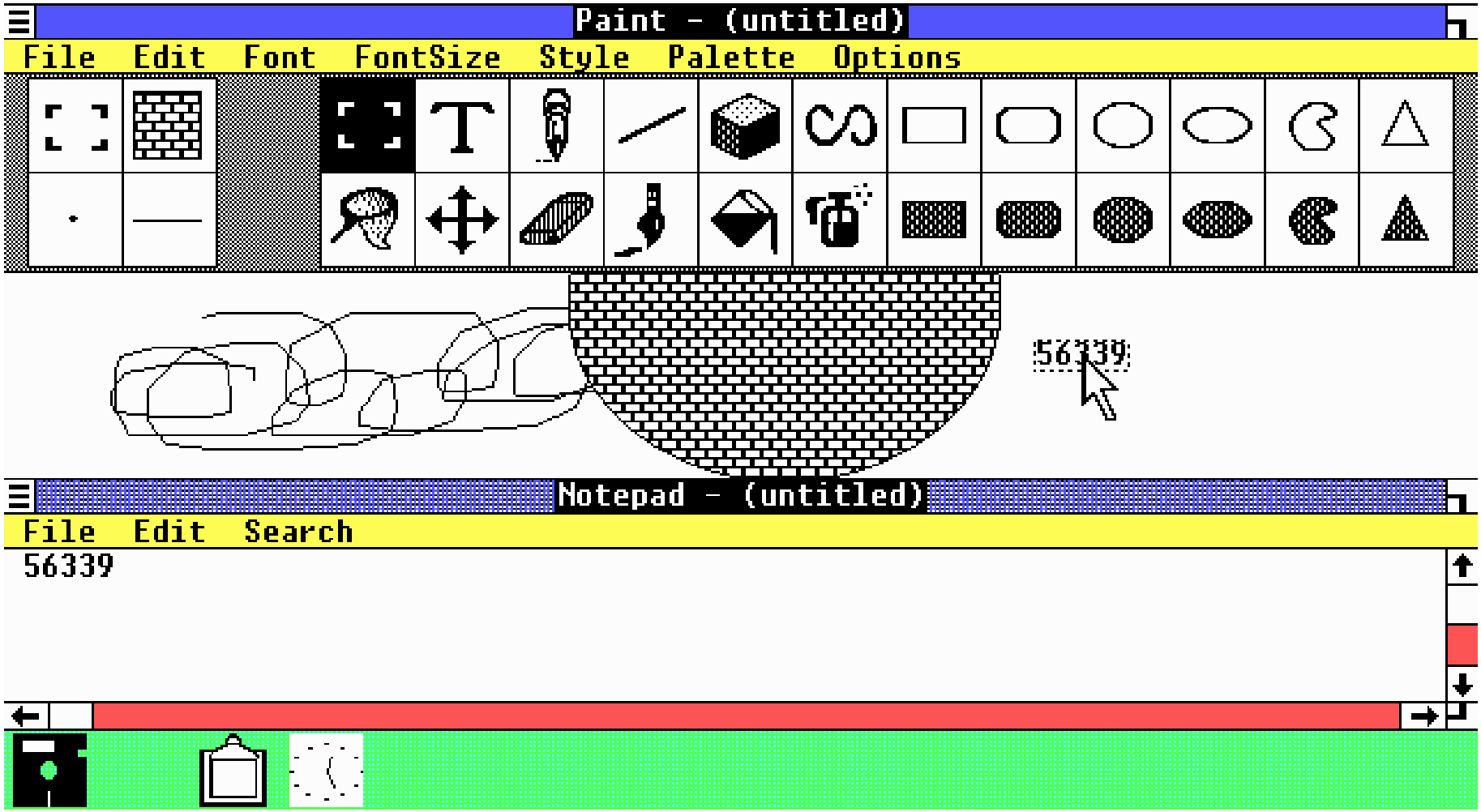




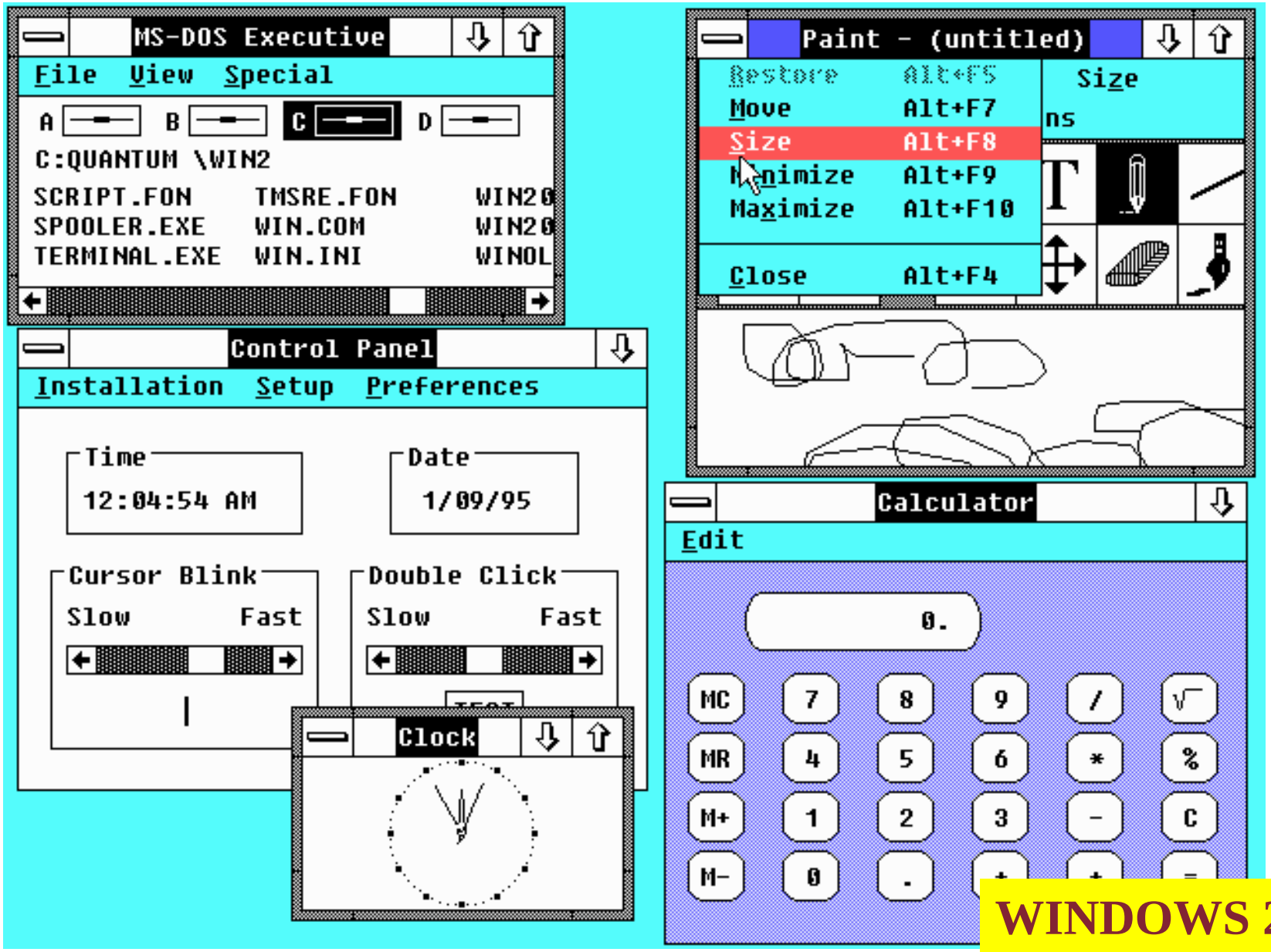




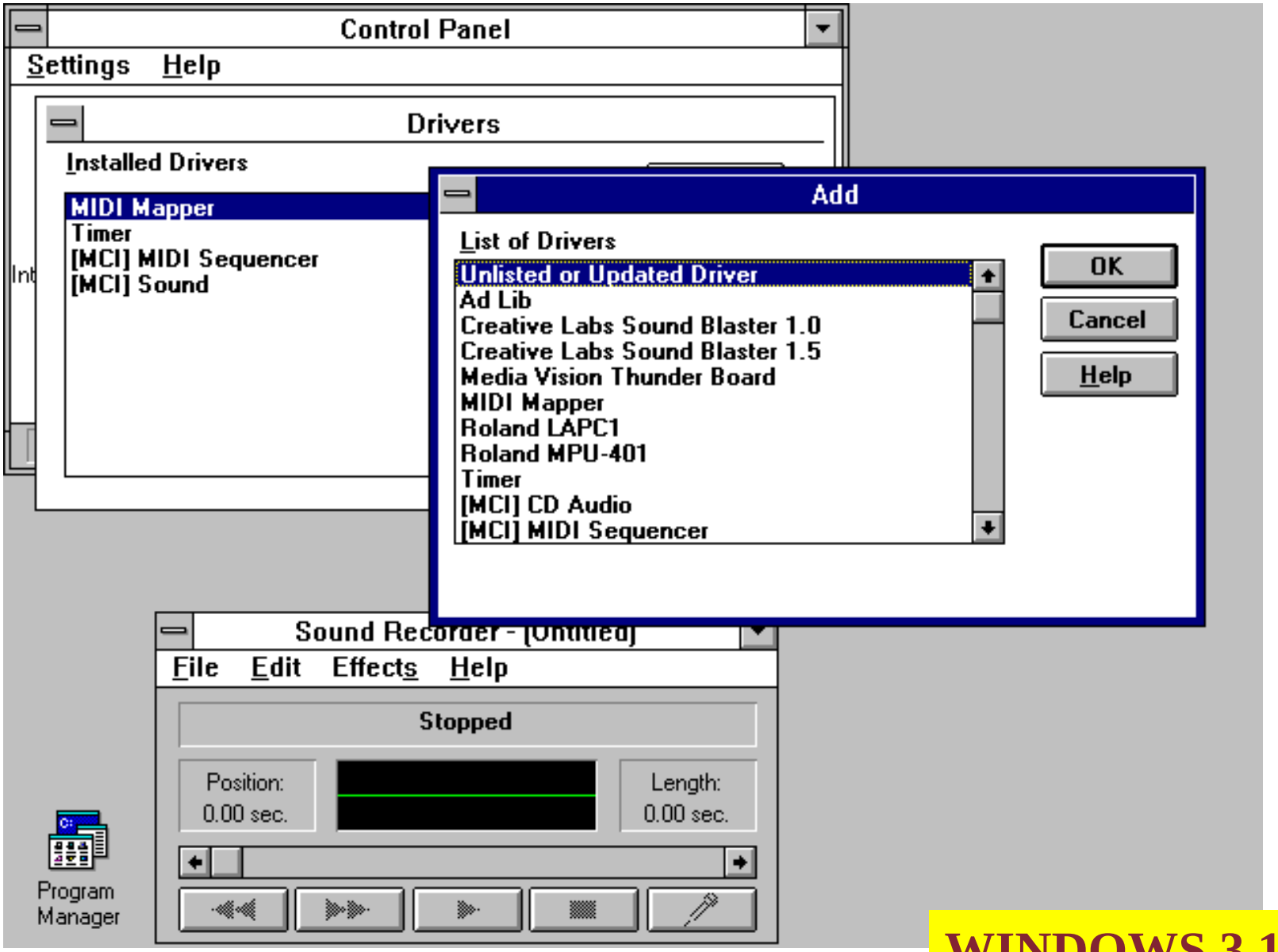
Paint per Windows 95 (Microsoft, 1995)


Paint - (untitled)
File Edit Font FontSize Style Palette Options
56339
Notepad - (untitled)
File Edit Search
56339

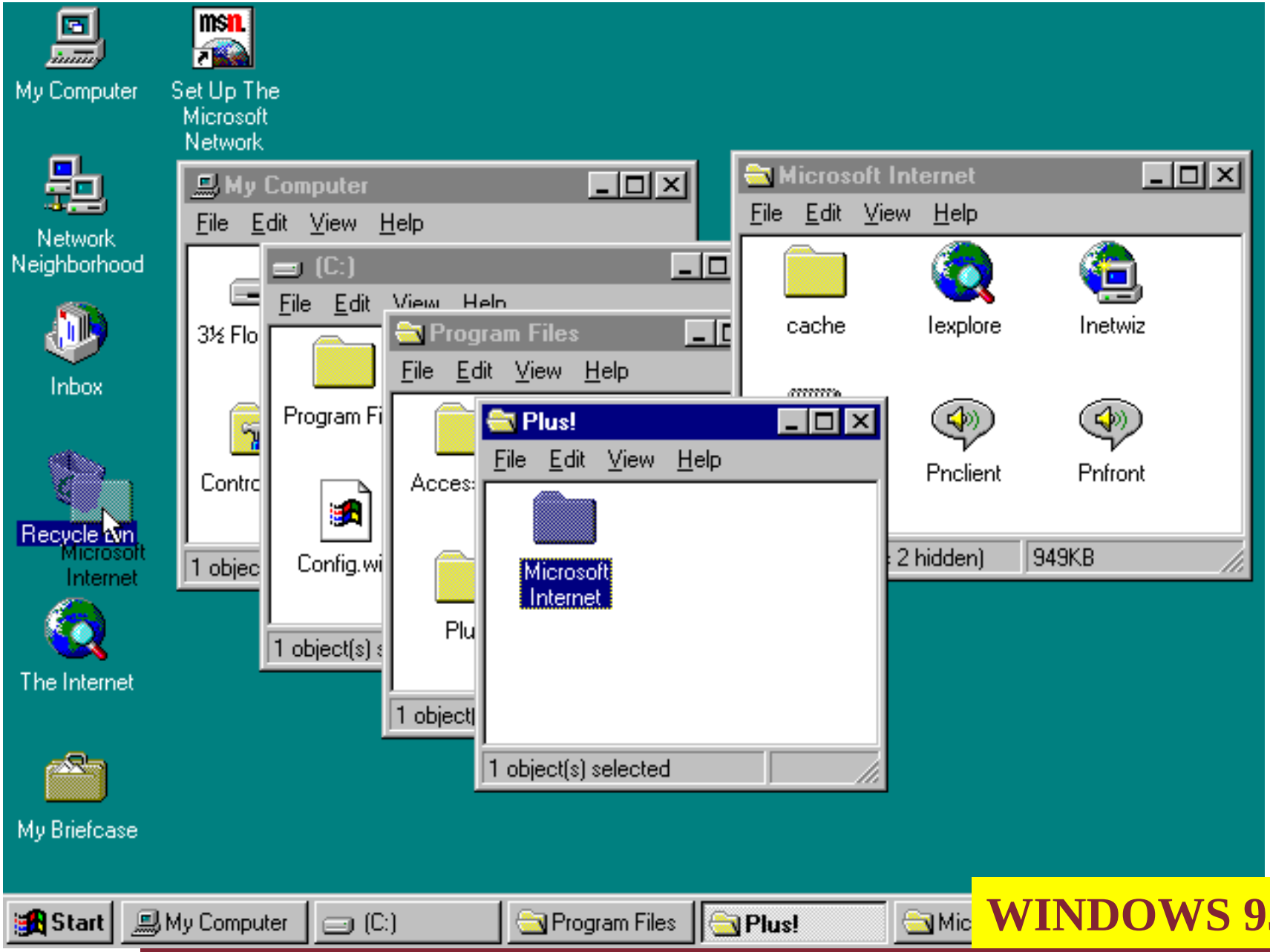
WINDOWS 1.0


MS-DOS Executive
File View Special
A B C D
C:QUANTUM \WIN2
SCRIPT.FON TMSRE.FON WIN20
SPOOLER.EXE WIN.COM WIN20
TERMINAL.EXE WIN.INI WINOL
Paint - (untitled)
Restore Alt+F5
Move Alt+F7
Size Alt+F8
Minimize Alt+F9
Maximize Alt+F10
Close Alt+F4
Size
ns
Control Panel
Installation Setup Preferences
Time
12:04:54 AM
Date
1/09/95
Cursor Blink
Slow Fast
Double Click
Slow Fast
Clock
Calculator
Edit
0.
MC 7 8 9 / √
MR 4 5 6 * %
M+ 1 2 3 - C
M- 0 .

WINDOWS 2.0


Control Panel
Settings Help
Drivers
Installed Drivers
MIDI Mapper
Timer
[MCI] MIDI Sequencer
[MCI] Sound
Add
List of Drivers
Unlisted or Updated Driver
Ad Lib
Creative Labs Sound Blaster 1.0
Creative Labs Sound Blaster 1.5
Media Vision Thunder Board
MIDI Mapper
Roland LAPC1
Roland MPU-401
Timer
[MCI] CD Audio
[MCI] MIDI Sequencer
OK
Cancel
Help
Sound Recorder - (Untitled)
File Edit Effects Help
Stopped
Position:
0.00 sec.
Length:
0.00 sec.
Program
Manager

WINDOWS 3.1

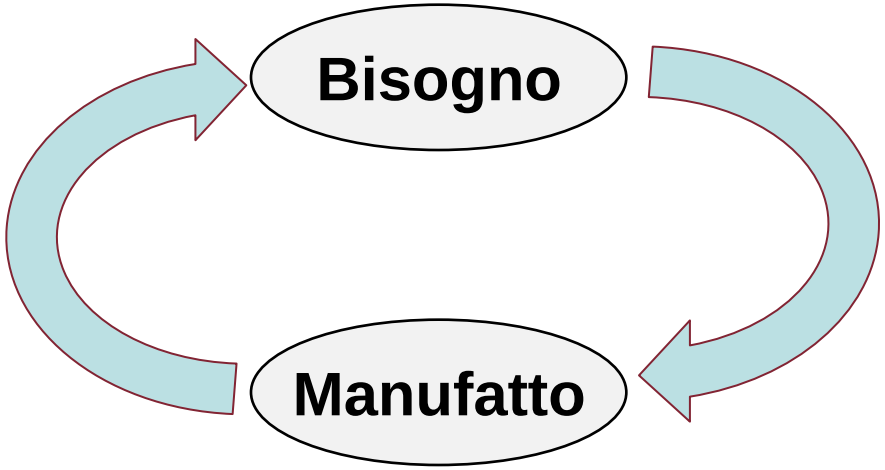

My Computer
Set Up The Microsoft Network
Network Neighborhood
Inbox
Recycle Bin
Microsoft Internet
The Internet
My Briefcase
My Computer
File Edit View Help
(C:)
File Edit View Help
Program Files
File Edit View Help
Plus!
File Edit View Help
Microsoft Internet
1 object(s) selected
Microsoft Internet
File Edit View Help
cache
Iexplore
Inetwiz
Pnclient
Pnfront
949KB
Start
My Computer
(C:)
Program Files
Plus!

WINDOWS 95

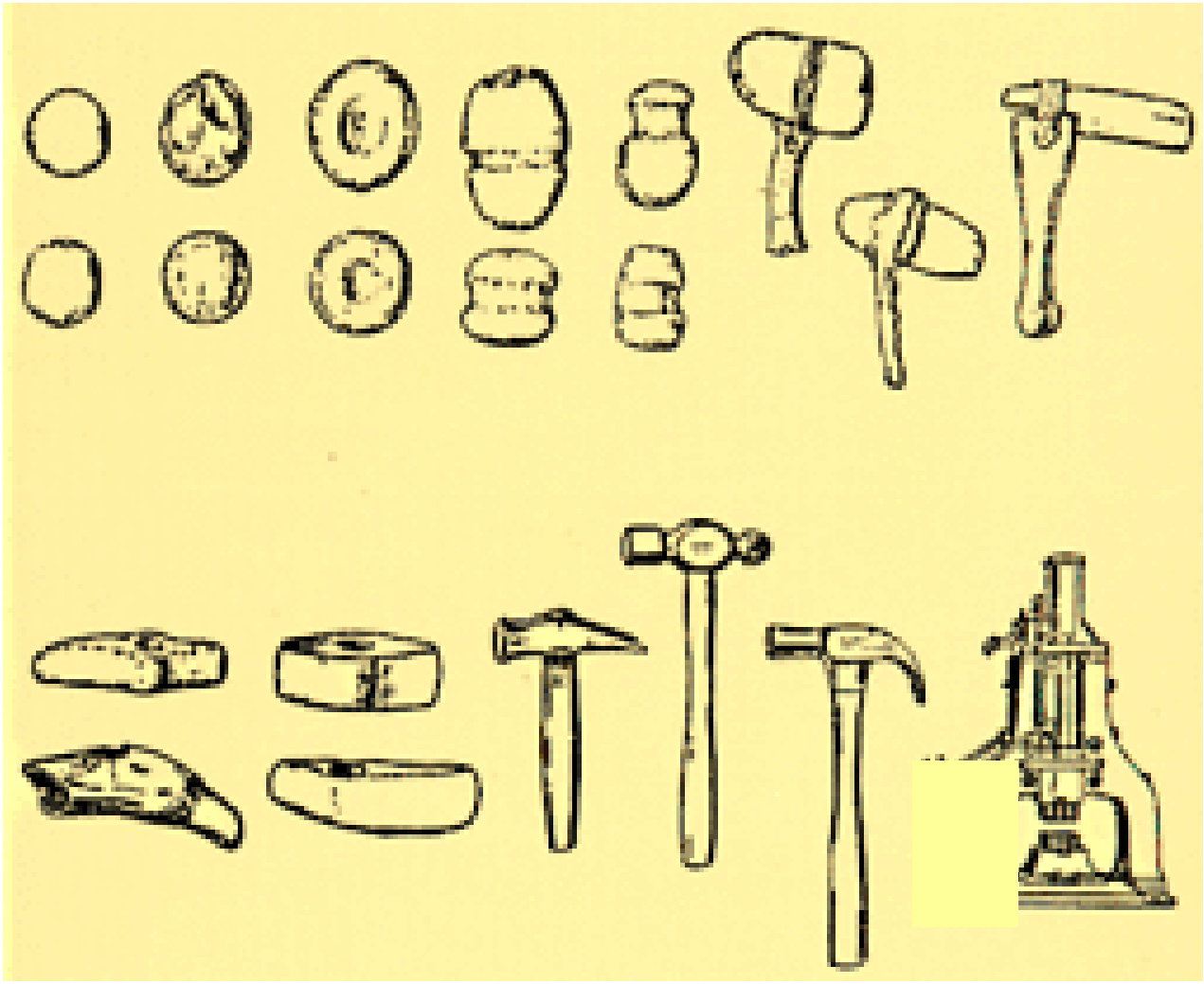
Il ciclo compito-manufatto

“Non appena viene introdotto un nuovo manufatto, inizia una co-evoluzione dell’artefatto e di chi lo usa”

D.C.Engelbart

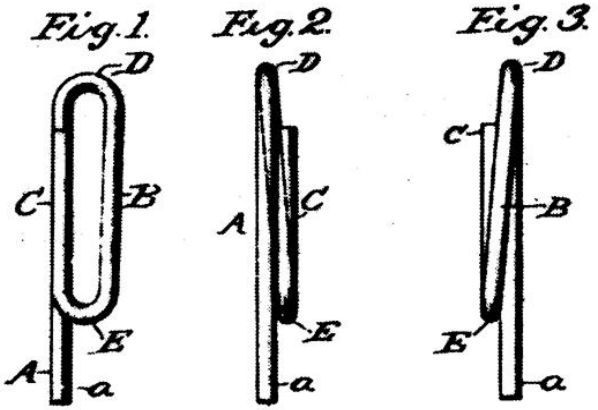


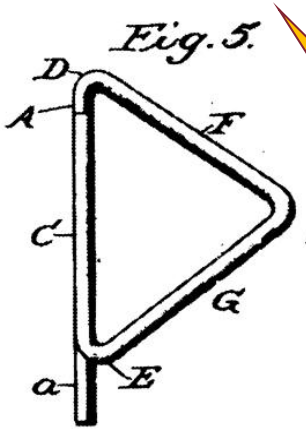
Esempio: evoluzione del martello



Esempio: “paper clip”

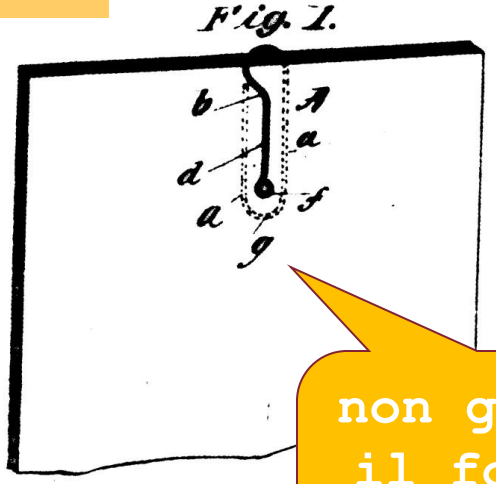
1898



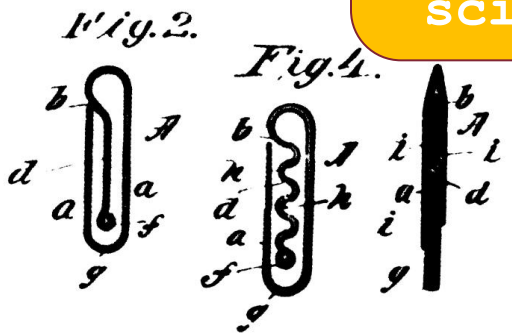


graffia il foglio

1900



non graffia il foglio, ma può scivolare



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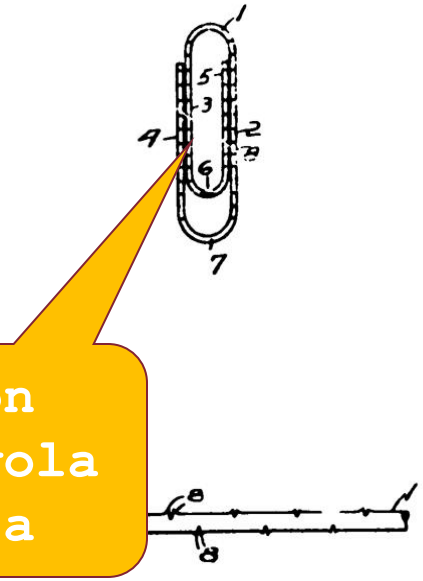
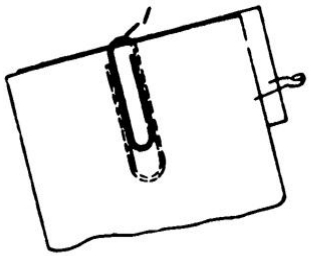


non scivola via



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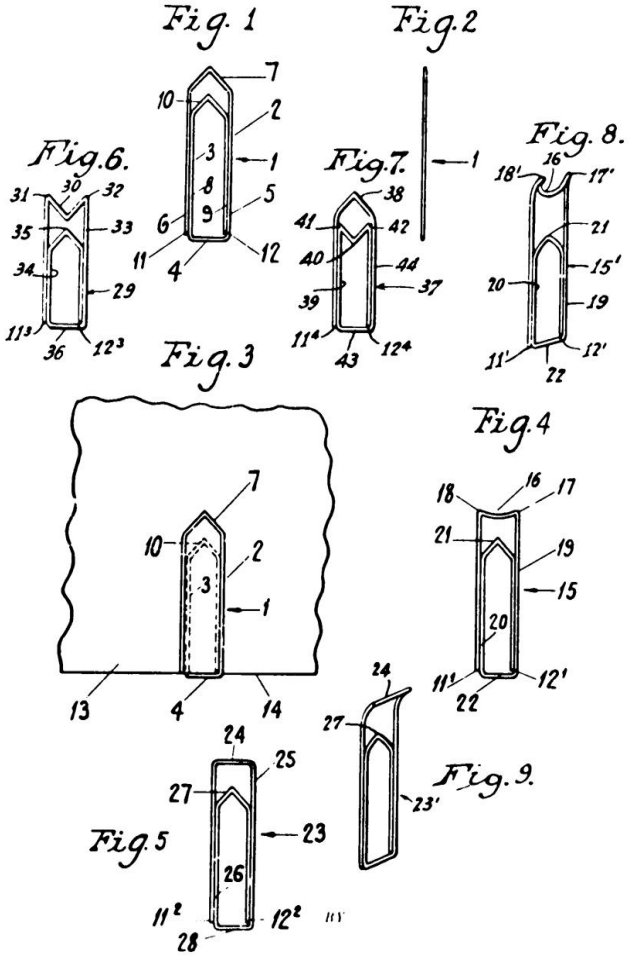
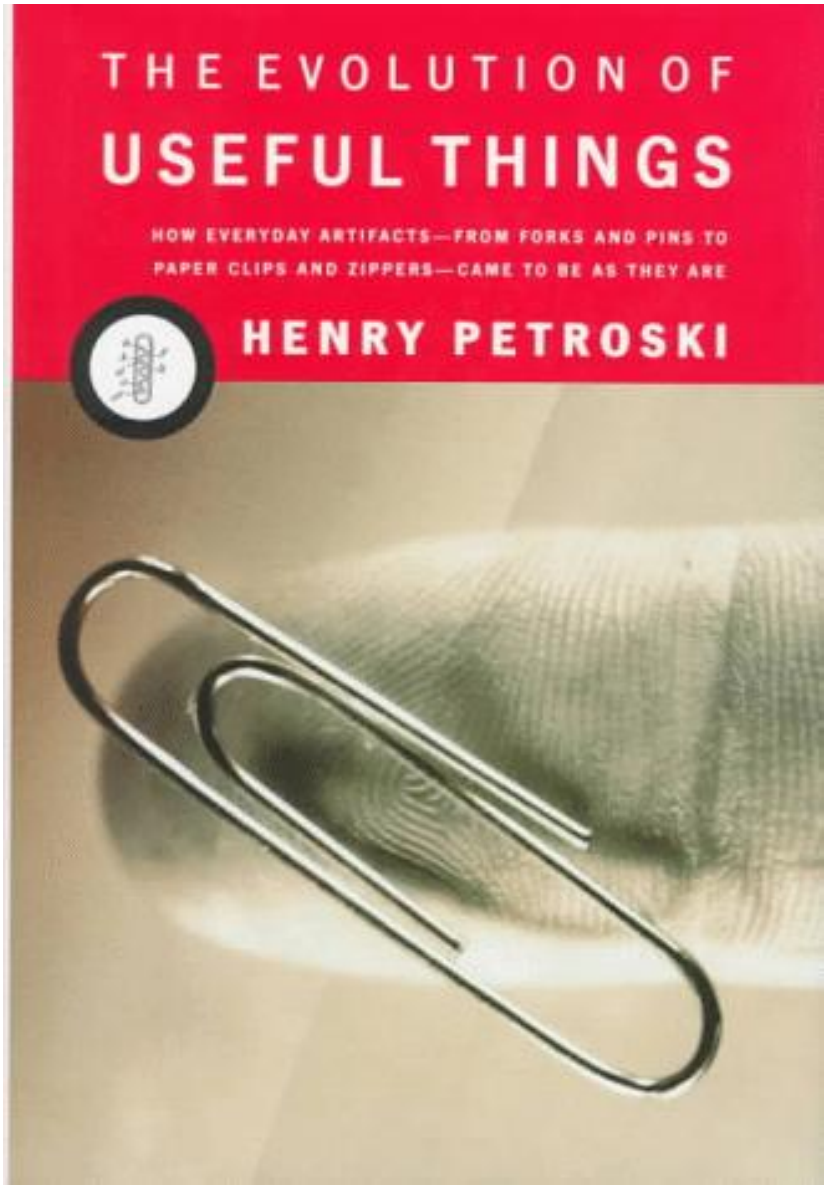



THE EVOLUTION OF
USEFUL THINGS
HOW EVERYDAY ARTIFACTS—FROM FORKS AND PINS TO
PAPER CLIPS AND ZIPPERS—CAME TO BE AS THEY ARE
HENRY PETROSKI

La evoluzione del software

Natura “immateriale”, manufatto evolutivo per eccellenza:

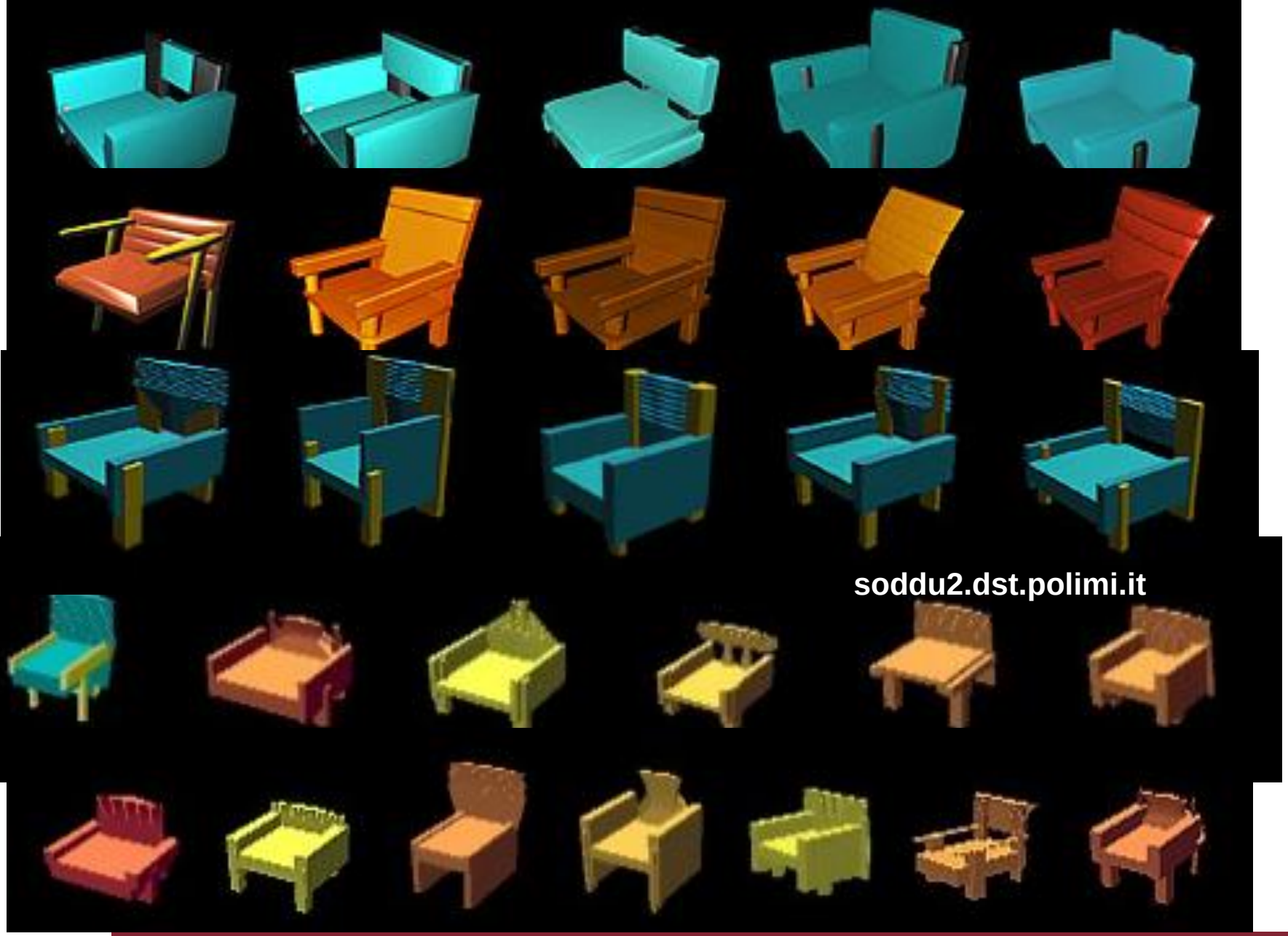
- non esistono limitazioni “materiali” a modifiche
- modifiche non richiedono modifiche impianti produttivi
- versione modificata distribuibile immediatamente e ovunque, a costo praticamente nullo (via Internet)
- concetto di perpetual beta

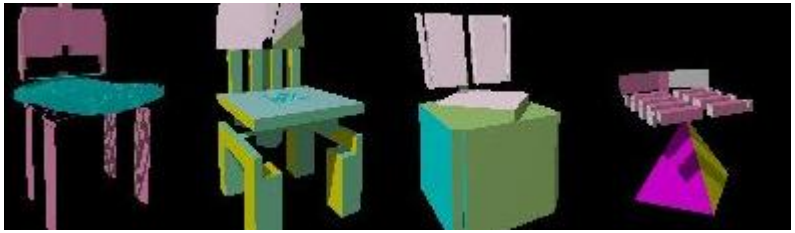
Una variante: Mutazione

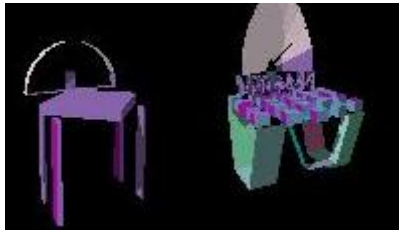
“Fenomeno per cui in una specie si origina un individuo che presenta alcuni caratteri diversi dai suoi ascendenti, e li trasmette alla discendenza”

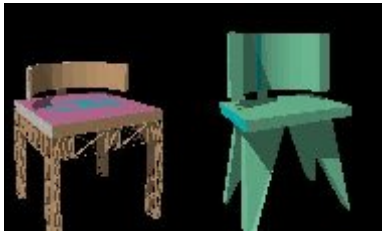
Esempio: design generativo

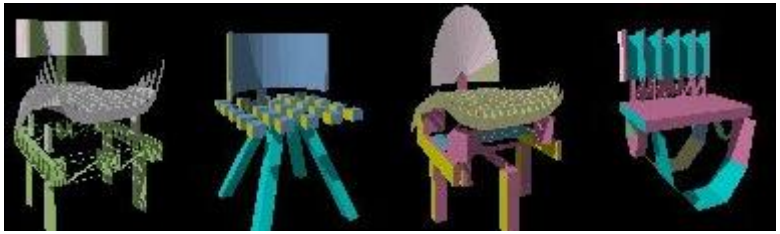
- Progettare un manufatto e affidare al computer il compito di generarne possibili “mutazioni genetiche”
- “metadesign” o “design di specie”: definire le caratteristiche essenziali di un manufatto e affidare al computer il compito di generarne possibili “incarnazioni”

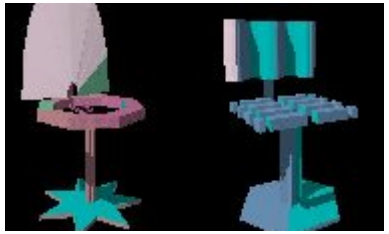

soddu2.dst.polimi.it

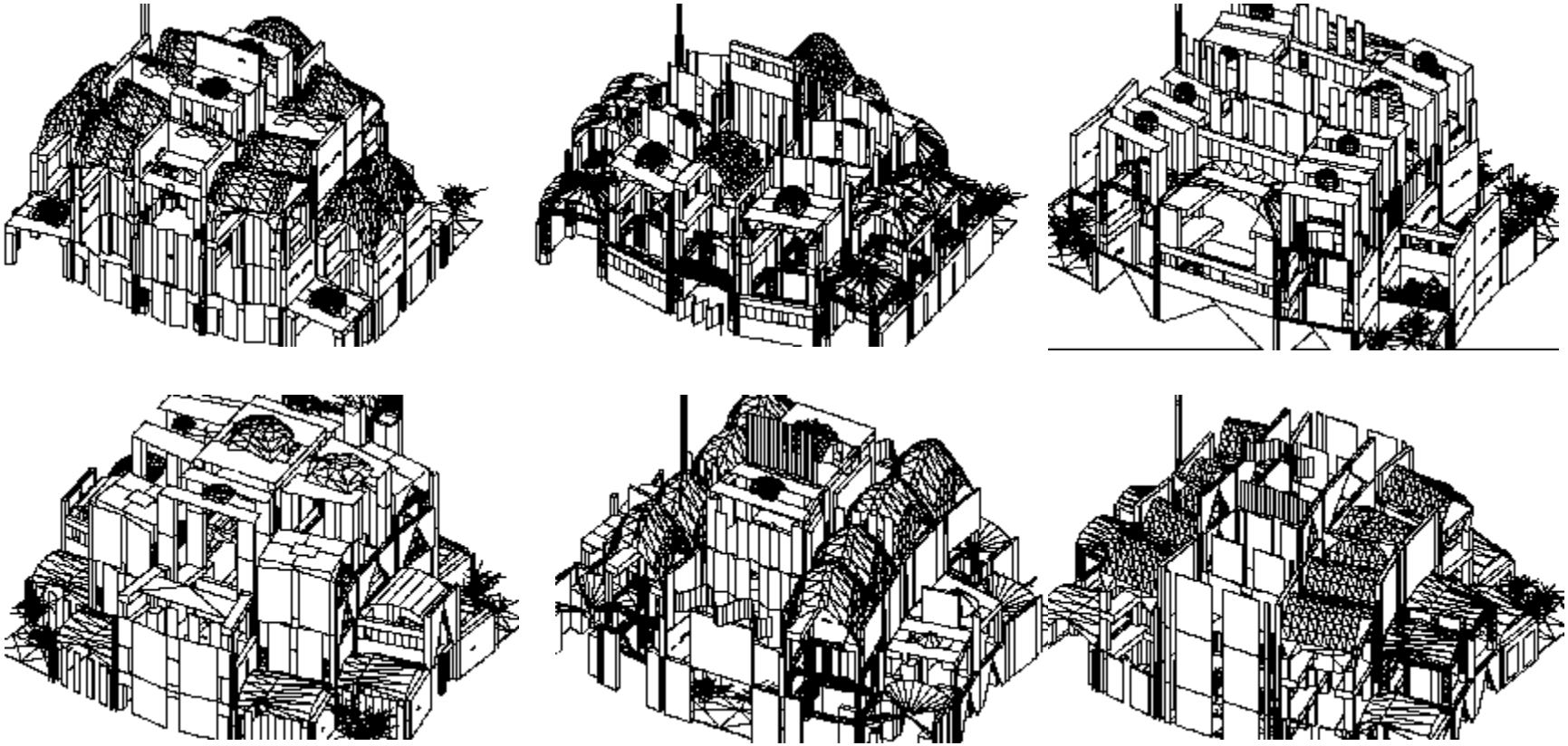


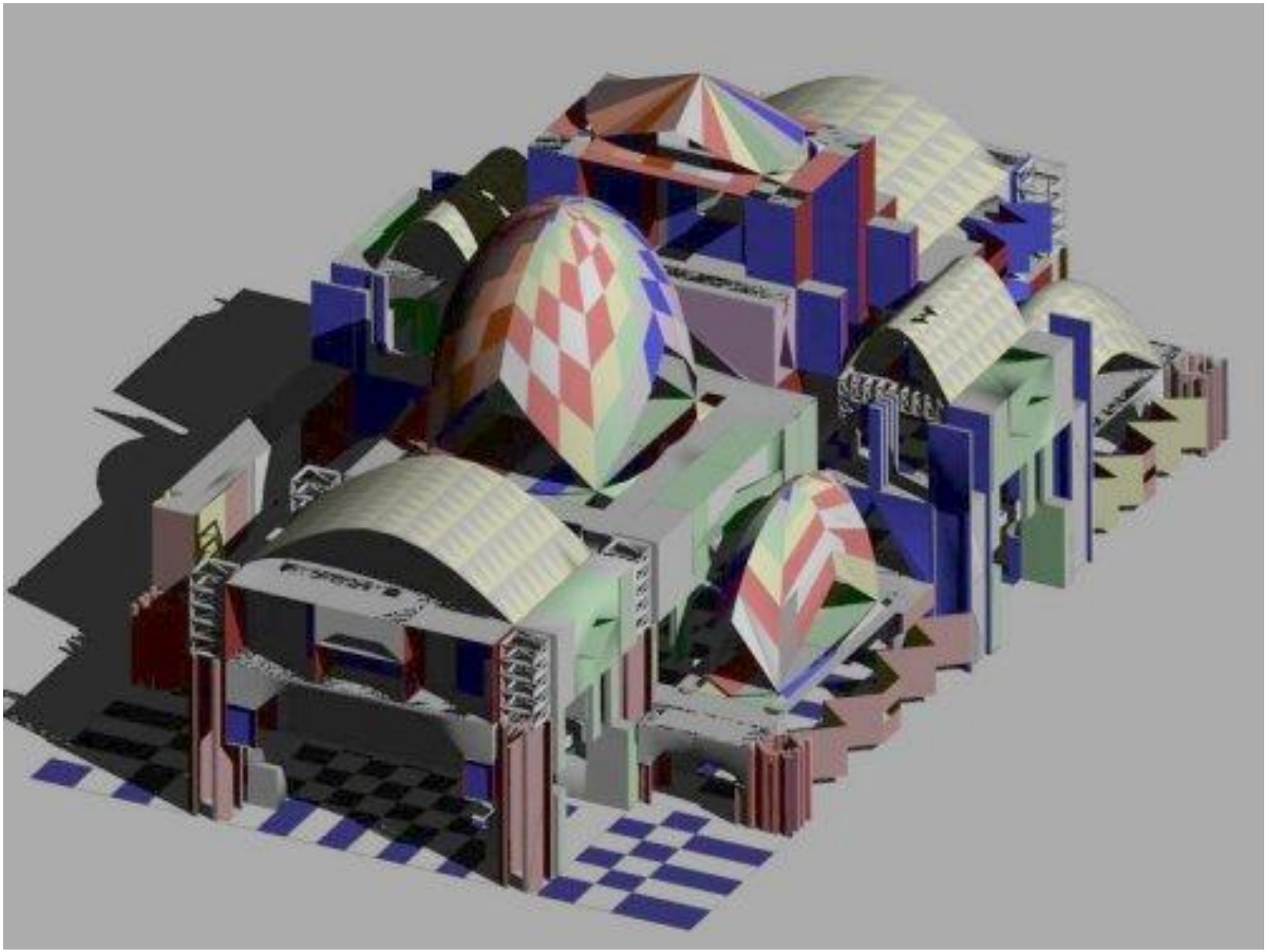




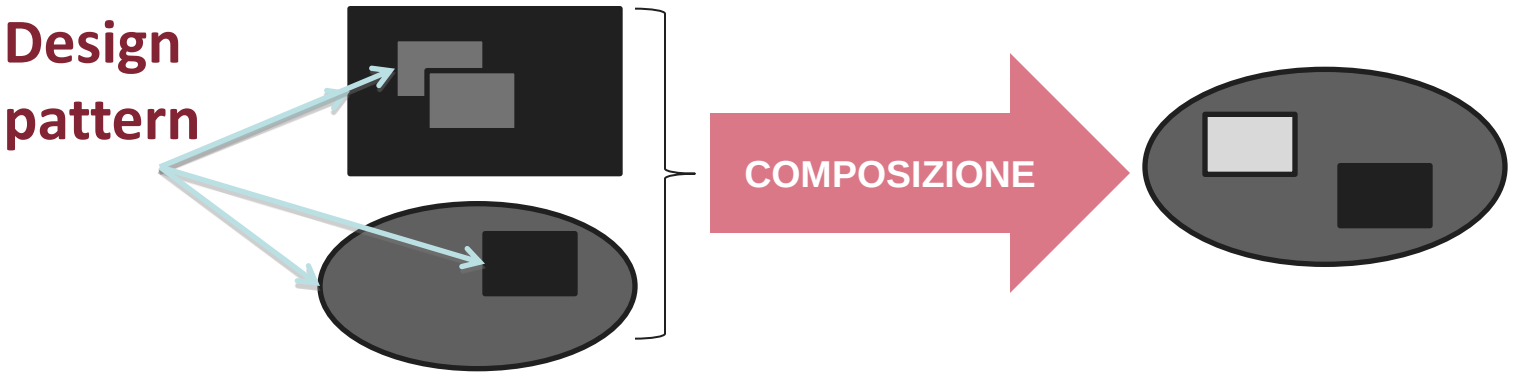






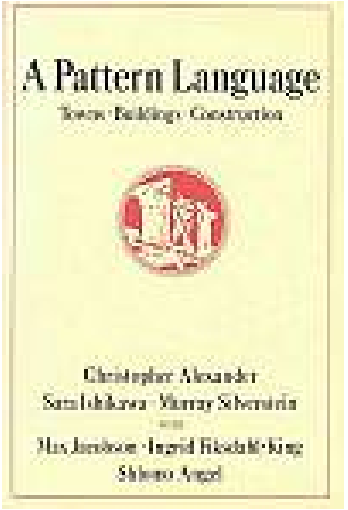


Composizione



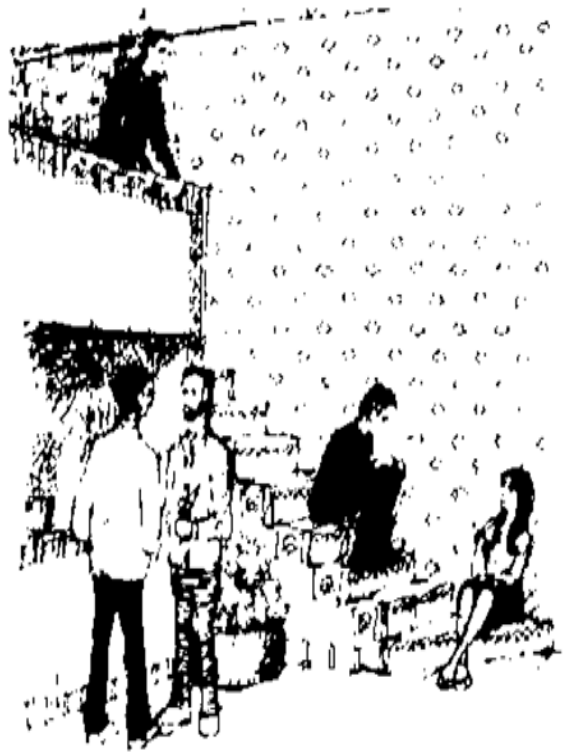
Design patterns: che cosa sono

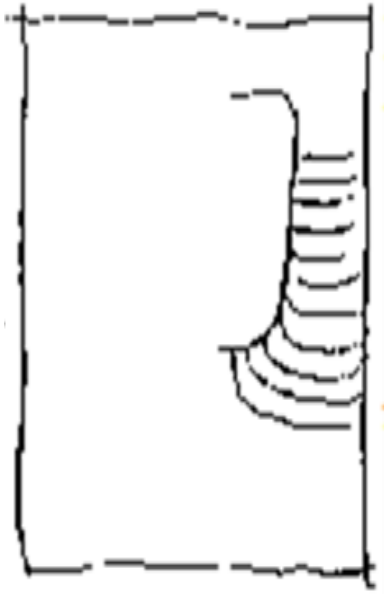
- Soluzione generale a problema di progettazione che si ripropone in molte situazioni, anche diverse
- Non soluzione “finita”, ma piuttosto modello, template da adattare a specifica situazione
- Concetto nasce in architettura a fine anni ’70 (Christopher Alexander), applicato a Ingegneria del Software da fine anni ‘80



Gateways mark the point of transition.

Design pattern in architettura





“Colloca la scala principale in una posizione chiave, centrale e visibile. Tratta l’intera scala come una stanza (o, se all’esterno, come un cortile). Disponila in modo che la scala e la stanza siano una cosa sola, con la scala che scende attorno a una o due pareti della stanza. Allarga il fondo della scala con finestre aperte o balaustre, e con ampi gradini, in modo che le persone che scendono lungo la scala diventino parte dell’azione della stanza mentre sono ancora sulla scala, e che le persone in basso usino naturalmente i gradini per sedersi”.

Da C.Alexander, A Pattern Language

I pattern di interazione uomo macchina: esempio

Design pattern per le funzioni di ricerca in un sito web (van Welie)

Advanced search
Autocomplete
FAQ
Help Wizard
Search Box
Search Area
Search Results
Search Tips
Site Index
Site Map
Footer Sitemap
Tag Cloud
Topic Pages

Pattern language per l'interazione

I formalismi di descrizione sono diversi, ma normalmente ogni pattern è descritto in una scheda che fornisce

- Il problema di cui si tratta
- Il pattern che lo risolve
- Le motivazioni
- L'ambito/limitazioni di applicazione
- Esempi di uso

Schede descrittive: esempi

- Problem
- Solution
- Use when
- How
- Why
- More examples
- Implementation
- Literature

Van Welie

- Problem summary
- Example
- Usage
- Solution
- Rationale
- [Discussion]
- [Sources]
- More examples

Toxboe

Design pattern: vantaggi

- Raccolgono lo stato della pratica
- Suggeriscono soluzioni ai progettisti
- Formazione di un linguaggio comune
- Diffondono gli “standard di fatto”
- Evitano di “reinventare la ruota”

Creazione

Ma esiste veramente la creazione dal nulla?

“Per inventare, serve una buona immaginazione e un mucchio di cianfrusaglie”

Thomas Alva Edison

Queste slides…

… si basano sul libro “Facile da usare”, dell’autore, dove si trovano tutte le necessarie spiegazioni. Vedi www.rpolillo.it