expressive interfaces
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expanding the roles of digital systems in human life

support a broad range of activities

emphasize human expression

ecosystems approach: combine methods (art, science)

interface design, knowledge representation, conceptual art

information visualization, pattern recognition, information retrieval

new hybrid methods of evaluation

qualitative data (ethnographic)

quantitative data
research areas

combinFormation
represent collections through mixed-initiative composition of image and text surrogates

embodied interfaces
choreographic buttons

location-aware gaming

locative media collection
combinFormation

represent collections through mixed-initiative composition of image and text surrogates

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information discovery

not just finding information

having ideas in the context of the stimulus of new information

creativity

collecting new sets of existing materials

seeing them in new ways
a replacement for an original item, which gives some description of the item, and how it can be obtained
digital surrogate
(aka hypersign)

represents an
information resource

special type of hyperlink
formed from metadata
tightly linked to the original

the surrogate is the object!?
prior representations of collections

textual list

spatial hypertext
evidence for image + text

working memory
phonological loop
processes auditory & text information
visuo-spatial sketchpad

dual coding strategy
for representation of surrogates

marchionini et al 1999-2003
“combined” surrogates for video -> better comprehension, reduced processing time
composition

“putting together”

assemble collection elements to form a connected whole

visual design principles represent relationships

spatial organization

compositing

fading

expressive
combinFormation
mixed-initiative composition of surrogates

User Initiatives
- Seeding
- Direct Manipulation Information Collecting
- Directing the Agent
- Direct Manipulation Composition

Agent Initiatives
- Generative Information Collecting
- Generative Temporal Visual Composition
- semantic model
- composition space

processes
- information finding / choosing / collecting
- visual composition

initiatives
- user
- agent
direct manipulation

information collecting

visual composition
direct manipulation
information collecting
drag and drop
Firefox Extension
metadata system

labels
values
types
details on demand
direct manipulation composition

rearrange, remove, edit, color, resize

navigate
generative agents

User Initiatives
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- Direct Manipulation Information Collecting
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Agent Initiatives
- Generative Information Collecting
- Generative Temporal Visual Composition
- semantic model

composition space

model

information collecting
temporal visual composition

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interface design to direct the agent
experiment 1

direct manipulation only

source format only

create a 3-level collection of psychology resources in 3 formats

formats of surrogates

- text
- images+text

formats of collection

- linear list
- spatial composition
results:
subjective measures

liked best \( [X^2(2) = 34.88, p < .001] \)
easiest to use \( [X^2 (2) = 16.12, p < .001] \)
experiment 1 addressed

format for presenting information collection to users

but: for information discovery questions, the answer is also a collection!
experiment 2

direct manipulation only

source format + answer format

4 divergent thinking questions

input surrogate collection format

linear text
composition of image+text

output surrogate collection format

linear text
spatial image+text
experiment 2 results

initial participants
ratings

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experiment 3 - mixed-initiatives
field study - initial deployment
ENDS 101/200 The Design Process

Hybrid and Invention Assignments

182 students
embodied interface
choreographic buttons

interactive art installation
body-based interface
promoting social interaction
collaborative art creation
a tale of two grids

two 3x3 grids
physical
visualized

direct spatial mapping: grid cells

choreography grid
physical point of interaction
movements captured via cameras

imagery grid
visualization of image collection (collage)
cross fading transition between images
interaction

recognized movements
  jumping
  crouching

system actions
  selection
  locking image (persistence)
  fast forwarding
  (finding specific images)

mappings
  position = selection
  jump = lock
  crouch = fast forward
affordances

Icon for locked or unlocked

Icon for fast forwarding

yellow border = selection

state indicator icons appear during selection
each has two visible states (i.e. open and closed lock)
spatially positioned to afford activating movements

images in collection represent literal and metaphorical up and down movements
evaluation

art exhibition /
party / user study

food and music
post-questionnaire
video-taped

movement-based vs. mouse-based
in same room, projected on two different walls

observing engagement and social interaction
It's funny to see people jumping and concentrated in looking at the screen. It seems more natural to talk and interrupt people in the movement-based than in the mouse-based.

### Evaluation

**Which involved more social interactions?**

- Movement-based: 16
- Mouse-based: 2

**Which was more entertaining to watch others use?**

- Movement-based: 18
- Mouse-based: 4
- Equal: 2
embodied interface
locative media collection

- collect images, sounds
  w GPS identifiers
- additional metadata
- retrieval by location
- visualizations including temporal composition