Concentric Ring View F+: Ring-Structured Graphical Search Interface

Tomoko Kajiyama†,*, Noriko Kando*,†, and Shin’ichi Sato*,†

†The Graduate University for Advanced Studies  *National Institute of Informatics

Background

Proposed “Concentric Ring View”

Objectives:
- flexibly treat multi-faceted metadata
- uniformly treat different types of attribute values
- search from ambiguous information needs
- easy operation even for novice users

Usability test by 36 junior high school students

Problem:
- feedback functions were not provided
  (1) missed favorite images
  (2) could not search for similar images

Objectives

Propose “Concentric Ring View F+”

- personal histories for reuse
- relevance feedback

Image Retrieval System

10,195 images designed for Web pages
Four attributes automatically obtained:
- color (two feature colors)
- atmosphere (pastel tone - dark)
- aspect ratio (landscape - square - portrait)
- size (bytes of image)

Operations

(1) Select attributes for search keys:
  click attribute name on category ring
(2) Adjust search key:
  drag key ring or click wheel button on key ring
  and rotate wheel
(3) Delete search key:
  click key ring
(4) Change priority of search key:
  click right button on key ring
(5) Display details:
  place cursor on image
(6) Save search history and favorite images:
  click right button out of key ring or on image
  while displaying details
(7) Browse the search histories:
  drag history ring or click wheel button on history ring
  and rotate wheel
(8) Search for similar images:
  click image or drag image to center

Concentric Ring View

Graphical User Interface

Category ring: line up attribute names
  use for starting searches with attributes
Key ring: line up attribute values
  search keys derived from attribute values on
  bottom part of key rings
  adjust search keys by rotating key rings
  range of search keys is in proportion to number of
  key rings
  outer key ring has higher priority

Display retrieved results:

- arranged in concentric circles according to search
  key values and their priorities
- higher ranked objects are larger and shown closer
  to center
- details are displayed by placing cursor on image

Concentric Ring View F+

Search history:

Save favorite images, search keys, and retrieved results
  saved all at once by capturing screen;
  browse histories by rotating history ring

Relevance feedback

Use user’s evaluation for retrieved results for query
  reformulation
  select image and move it to center:
  its attribute values are used as search keys
  (higher ranked objects are displayed closer to center)

Operations

(1) Select attributes for search keys:
  click attribute name on category ring
(2) Adjust search key:
  drag key ring or click wheel button on key ring
  and rotate wheel
(3) Delete search key:
  click key ring
(4) Change priority of search key:
  click right button on key ring
(5) Display details:
  place cursor on image
(6) Save search history and favorite images:
  click right button out of key ring or on image
  while displaying details
(7) Browse the search histories:
  drag history ring or click wheel button on history ring
  and rotate wheel
(8) Search for similar images:
  click image or drag image to center

National Institute of Informatics OPEN HOUSE 2005, June 2-3, National Center of Sciences