Information Interfaces
Research Group Sampler

James Eagan, Mike Fulk, Ivy Ho, Todd Miller, Rod Peters, Cathy Polk, Jun Xiao, Alex Zhao, John Stasko
Problem

Available data (helpful & not helpful) is growing beyond human capabilities

Media
Internet/WWW
Sensors
...

How do we harness it to make our lives better?
Information Explosion

PEOPLE ARE GETTING STUPIDER EVERY DAY, RELATIVELY SPEAKING.

THE COMPLEXITY OF THE WORLD IS INCREASING GEOMETRICALLY.

BUT YOUR ABILITY TO LEARN IS AT THE SAME SLOW TRICKLE IT HAS ALWAYS BEEN.

INFORMATION IS GUSHING TOWARD YOUR BRAIN LIKE A FIREHOSE AIMED AT A TEACUP.

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Research Group Focus

- Develop ways to transform *data* into *information* (understanding, insight) thus making it useful to people

- Information Interfaces
  [www.cc.gatech.edu/gvu/ii]
Research Projects

Two main themes:
- Using visualization to help think
- Anthropomorphic UI agents

Today’s Brown Bag
- Overview of the eclectic set of projects that our group is working on
- Provides a sense of what we do, but not restricted to just these things
Community Awareness

- Hard to keep up with a large community
  - “What’s going on around here?”
  - “Who’s out there?”

- Data already exist, but seldom transform to information
  - Attention is a precious resource
  - Display space is limited
Opportunistic Interfaces

- Integrate data from multiple sources
- Calm presentation
  - Unobtrusive, start in periphery of attention
  - “Glanceable”
  - User decides when to move them into center of attention
What’s Happening?

Communication-bar
What’s Happening?

Communication-bar

Event

CoC Welcome Reception
3:00–4:00pm
CCB Lower Courtyard

Weather

Forecast as of 10:36 am EDT on September 28, 2000
This Afternoon: Mostly sunny. Highs in the lower to mid 70s. Northeast wind around 10 mph.
Tonight: Mostly clear. Lows from the upper 40s to the lower

Contributed stories

[gradtea] oblivion
despite all the attempts by proletarians of metro atlanta area, the bolshevik revolution is postponed by another two weeks.
so, as your grad tea czar, I say lets eat pizza. if you have any

Discussions

The New York Times apologizes
azhao: Interesting
Say: Interesting
What’s Happening?

- Web-collage screen-saver
  - Collage server crawls CoC web to find pages with images
  - Collage server builds random image collages for randomly selected pages
  - Screen-saver client retrieves collages and displays them
- More opportunistic
- More screen space to utilize
Machine Learning for Video-Based Rendering

The video clips on this web page show the results described in our NIPS 2000 paper. They appear in the same order as in the paper. Your browser has to have a MPEG file association to play them. Click on the image to see the video clips.

http://www.cc.gatech.edu/cpl/projects/videotexture/NIPS2000/vtbody.htm
What’s Happening?

- **Status**
  - Available on networked Unix and WinNT
  - Beta communication-bar on MacOS
  - Looking for contributors

- **Research challenges**
  - Other possibilities in interface design
  - Content collection
  - Evaluation
Information Overload

Email, weather, stocks, sports scores, instant messengers, news groups, traffic, web page updates, to do’s, news headlines, birthdays, bills, bank accounts, auctions, movies, travel specials, TV schedule, calls for papers, social awareness, team awareness, etc,…
Information Art

- LCD screen ambient display
  - User identifies a source of information
  - “Paint” its representation on the canvas

- Provides:
  - Many sources
  - Meaningful
  - Minimal distraction
InfoCanvas Interface
Status

- Advanced prototype
  - Implemented in Java and Swing
  - Basic resources (mail and web) and basic painting interface functional
  - Working on more advanced capabilities

- Looking for artistic people to help!
Small Screen Displays
Small Screen Displays

Design Scenarios

Wireless Web

GVU Brown Bag
Small Screen Displays

Normal View
Small Screen Displays

Split View

Fisheye View

Overview

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Small Screen Displays

- **Ongoing Work**
  - Build more prototypes based on information visualization techniques
  - Explore opportunities to customize content or displays for users
  - EVALUATION OF DESIGNS
  - Explore usability issues with Small Screens and PDA’s in particular
News Web Site on PDA

- Exploring the design space of news-oriented web sites on PDAs

- Problems
  - Lots of articles & information
  - Want to support fast browsing and detailed reading
  - People like pictures
Design 1

Use icons to represent news categories

News image thumbnails
Elaboration

List of News topics under “World” category

Display a particular news content

Select
Alternate Design

Optional to display news topics as either keywords or image thumbnails

Expandable space to view news content
Current Status

- Refining designs and considering alternatives
- Implementing prototype pages
- Planning empirical study
Anthropomorphic UI Agents

Cons
- distract users
- reduce control

Pros
- convey cues
- enhance trust
Wizard of Oz Experiment

Does the talking head really improve the usability of the system compared to a more traditional, invisible solution?

Want to factor out (in)competence as an issue

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Variables

- Variations may occur in:
  - Users
    - Different people may have different opinions
  - Tasks
    - Instructional, persuasive, intermediary
  - Agents
    - Appearance: static vs. animated, nonhuman vs. humanoid ...
    - Personality: intro/extrovert, humor, meek vs. forceful ...
    - Voice: rate, pitch, volume and intelligibility ...
    - Behavior: proactive vs. reactive, pop-out vs. always-on-top

- Dependent measures
  - Performance and subjective appeal
Agent Software

Haptek Corp.

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Status

- Prototype
  - Control various aspects of the talking head
- First experiment
  - Run pilots on agent as recommender
- “Holy grail”
  - Making a fully functional, intelligent and competent talking head agent
Motivation

WebCQ – Prof. Ling Liu
- Monitors web page changes
- Notifies users of these changes
- Too heavyweight

How can we communicate web page changes in a more natural, accessible manner?
Broadening the Scope

- Explore social implications
  - Do colleagues at work visit web pages that may interest me?
  - What kinds of people visit these pages, and how often?
- “Group bookmarks”
  - Shared list of pages useful to people in a certain group
  - Users choose to subscribe to particular groups based on their interests
Objectives

- Develop representation for page change histories and user/group access patterns
  - Facilitate easy browsing
  - Provide calm notification of changes
  - Illustrate trends in web page changes
  - Visualize relationships among people

Emerging Area: Social Visualization
Webwatch
Issues

- Large data sets
  - Scalability!!!

- What do users want to see?

- Privacy concerns
  - Voluntary consent
Problem:

Personal information management and archiving has become a more complex and time-consuming process due to the information technology revolution.

“That pile of paper ... went on living like the watch on a dead soldier’s wrist.”

-Jean Cocteau
Qualitative Research Study

What I want to learn about

- Types of information stored
- Where and how information is stored
- Clean-up and discard processes
- Underlying data structures
- External and internal memory cues
Qualitative Research Study

✿ In-Depth Interviews
  ▲ Learn about people’s stories and gain an understanding of their experiences
  ▲ Interview people in locations where they are immersed in their information space
  ▲ Use purposeful sampling as an effective strategy to represent population
Qualitative Research Study

- So Far...
  - Interviews are being conducted now
    - looking for participants...
  - Objectives
    - develop critical themes
    - discern common processes
    - dialogue → visual representations
Design Goal

TIPSTER!!!

An interactive, peripheral visual application that aids information management.
Network Visualization

Joint with Ellen Zegura

Problem: real networks are LARGE

- GT-ITM
- Large Model
- Various Properties
  - Connectivity
  - Latencies
  - Saturation

What’s going on?
Netvizor
Challenges

- Scalability
- Graph layout
- Layout manipulation
Sunburst

Visualizing file and directory structures

Root dir at center
Color - file type
Angle - file/dir size

On Solaris: /usr/local/public/bin/sunburst
Software Visualization

- Using visualization and animation to look inside the black box of a program or algorithm
- Can we help developers test, debug, optimize, and maintain their code better?
Software Testing

Tarantula system

Visualization of program run against a suite of test inputs

Seeking to assist fault localization

With Prof. MJ Harrold, Jim Jones, James Eagan
For More Information...

www.cc.gatech.edu/gvu/ii