Information Interfaces Research Group Sampler

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Georgia Institute of Technology

Information Interfaces

GRAPHICS VISUALIZATION & USABILITY CENTER

Problem

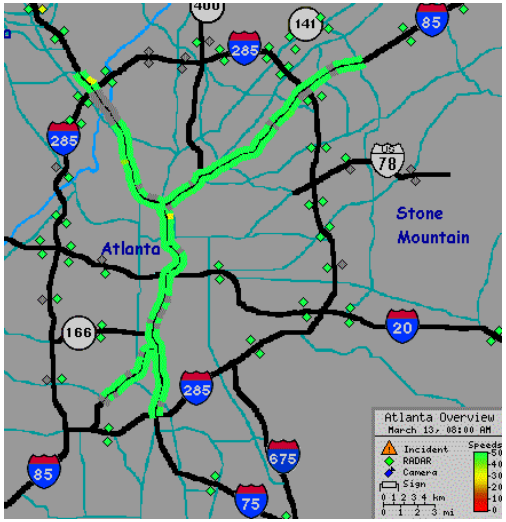
- Available data (helpful & not helpful) is growing beyond human capabilities
  - Media
  - Internet/WWW
  - Sensors
  - …

PGA TOUR

HONDA CLASSIC

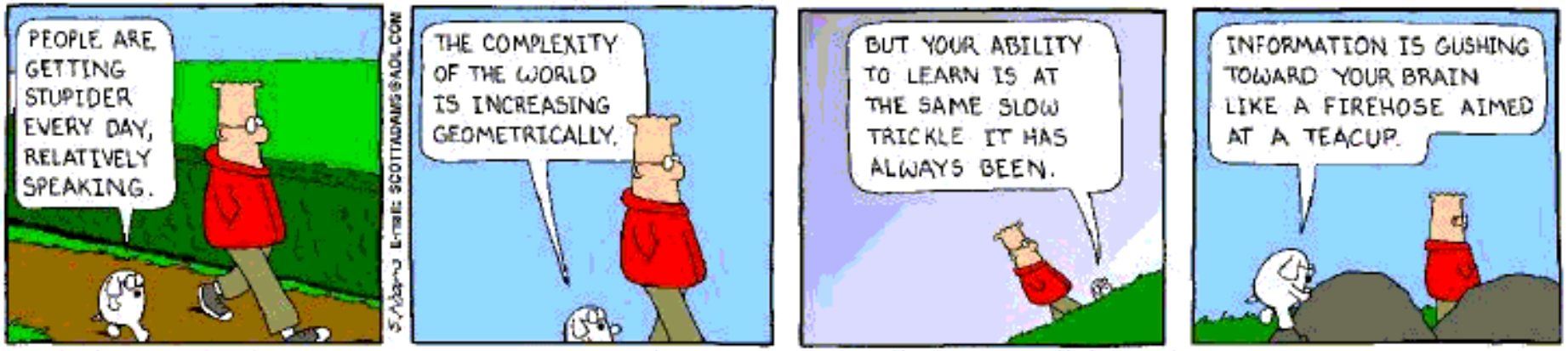
Updated 6:58 PM ET, 03/12/99

Pos	Player	Today	Thru	Tot
1	BOOKER	-6	F	-13
T 2	PRIDE	-4	F	-9
T 2	HUGHES	-4	F	-9
T 2	DUNAKEY	-7	F	-9
T 5	TOLLES	-6	F	-8
T 5	WATTS	-4	F	-8
T 5	STANKOWSKI	-5	F	-8
T 8	STEWART	-5	F	-7
T 8	SUTTON	1	F	-7
T10	PARRY	-3	F	-6
T10	MCCALLSTR	-2	F	-6
T10	MORGAN	-3	F	-6
T10	CHEESMAN	-3	F	-6
T10	GEIBERGER	-6	F	-6
T10	DALY	-5	F	-6



- How do we harness it to to make our lives better?

Information Explosion



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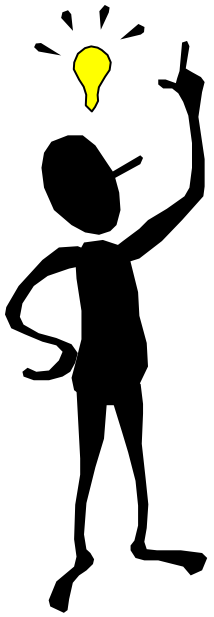
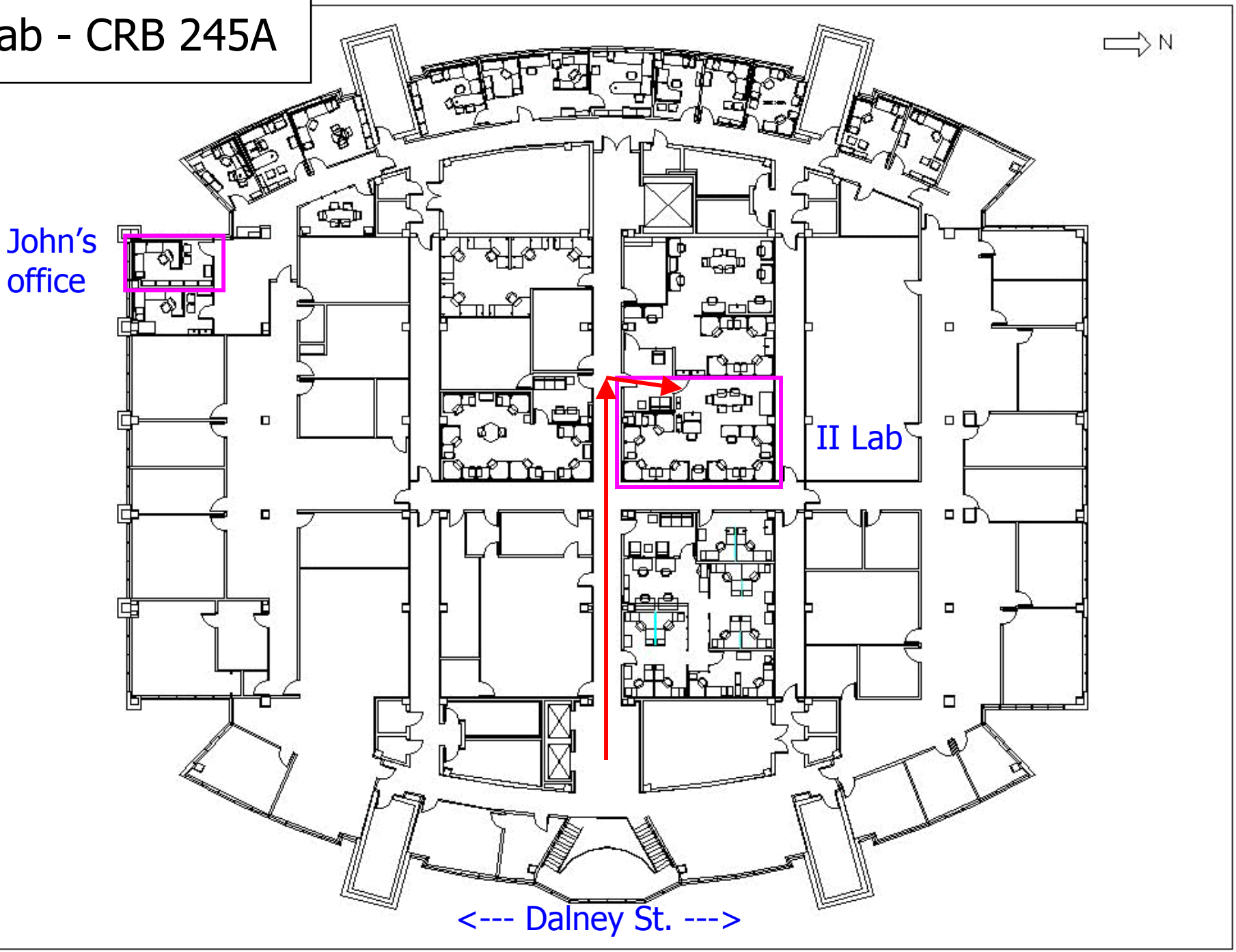
Research Group Focus

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

- Information Interfaces
  `www.cc.gatech.edu/gvu/ii`



Lab - CRB 245A



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

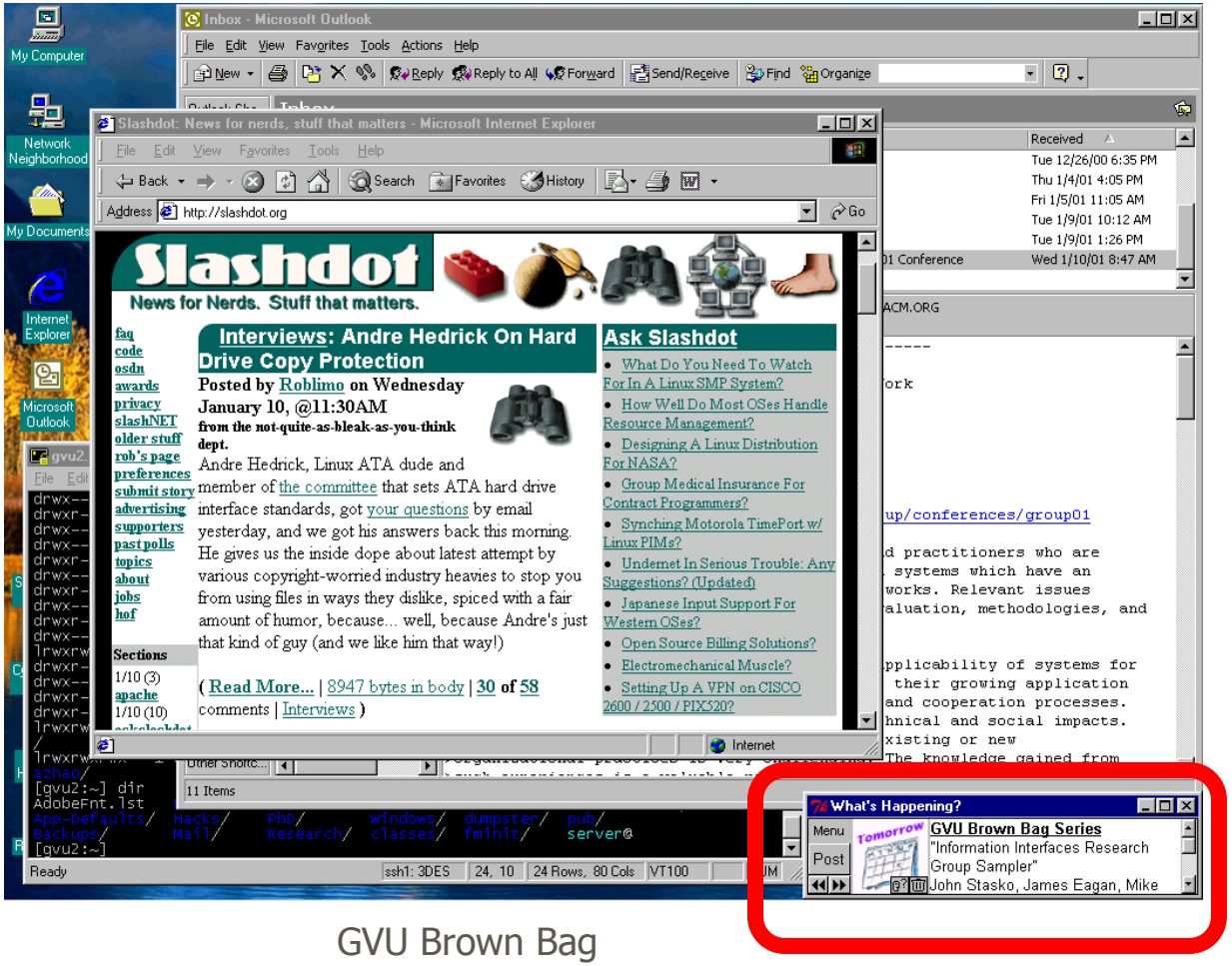
- Hard to keep up with a large community
  - "What's going on around here?"
  - "Who's out there?"
- Data already exist, but seldom transform to information
  - Attention is a precious resource
  - Display space is limited

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?

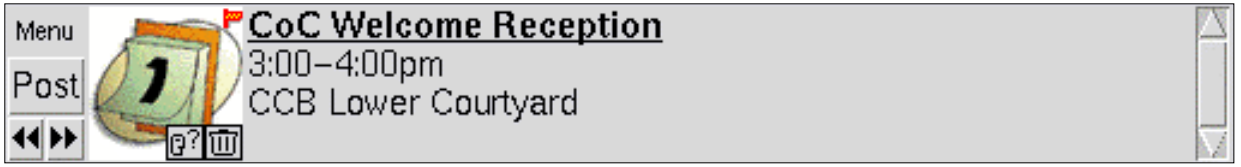
- Communication-bar



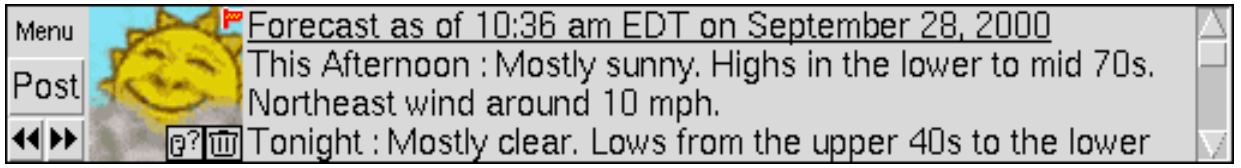
What's Happening?

- Communication-bar

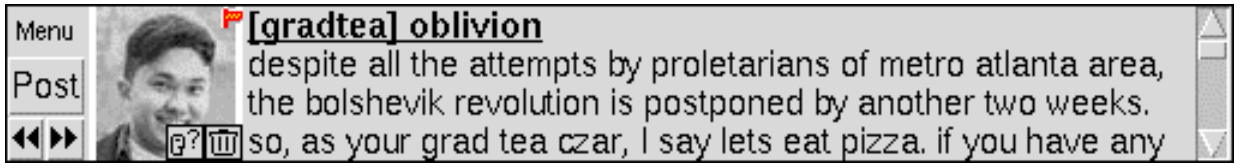
Event



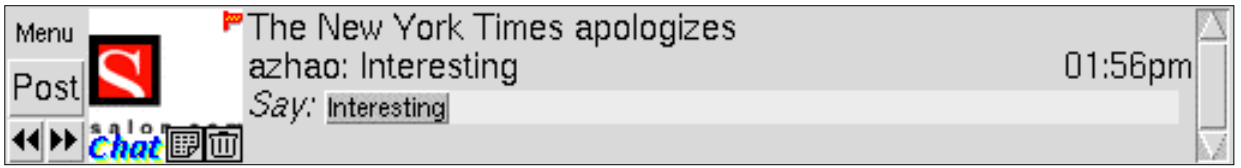
Weather



Contributed stories



Discussions



What's Happening?

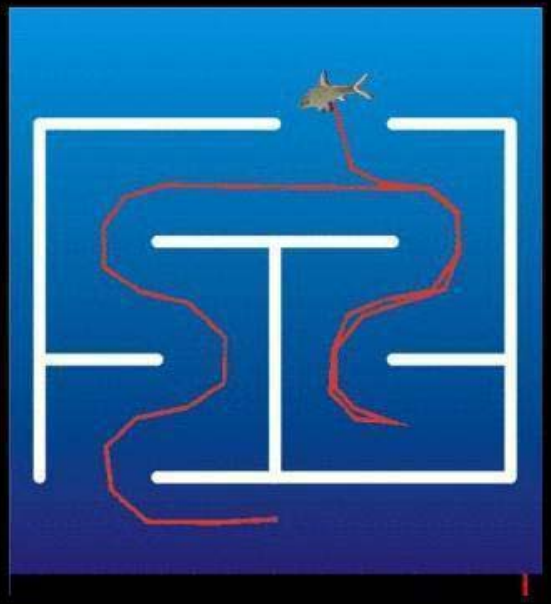
- Web-collage screen-saver
  - Collage server crawls CoC web to find pages with images
  - Collage server builds random image collages for randomly selected pages
  - Screen-saver client retrieves collages and displays them
- More opportunistic
- More screen space to utilize

Smokey Mountains... First trip

http://www.cc.gatech.edu/people/home/pradnya/pictures/smokeys0899.html

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. Yo browser has to have a MPEG file association to play them. Click on t



http://www.cc.gatech.edu/cpl/projects/videotexture/NIPS2000/vtbody.htm

Weather

75/85 at 14th St

AccessAtlanta Weather Forecast

The Weather Channel Doppler Radar

17

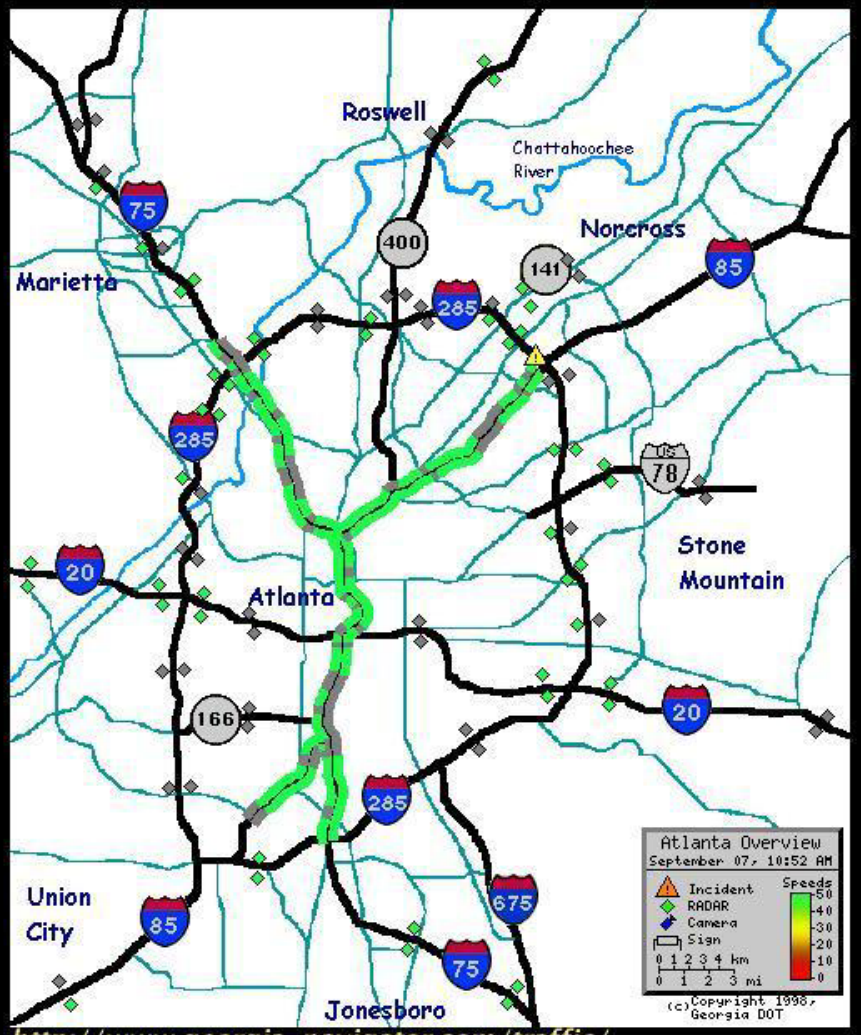
75/85 N of North Ave

Traffic

75 S of Delk Rd

75/85 N of 10th St

85 at Camp Creak Pkwy



http://www.georgia-navigator.com/traffic/

85 S of Plesantdale Rd

75/85 S of 10th St

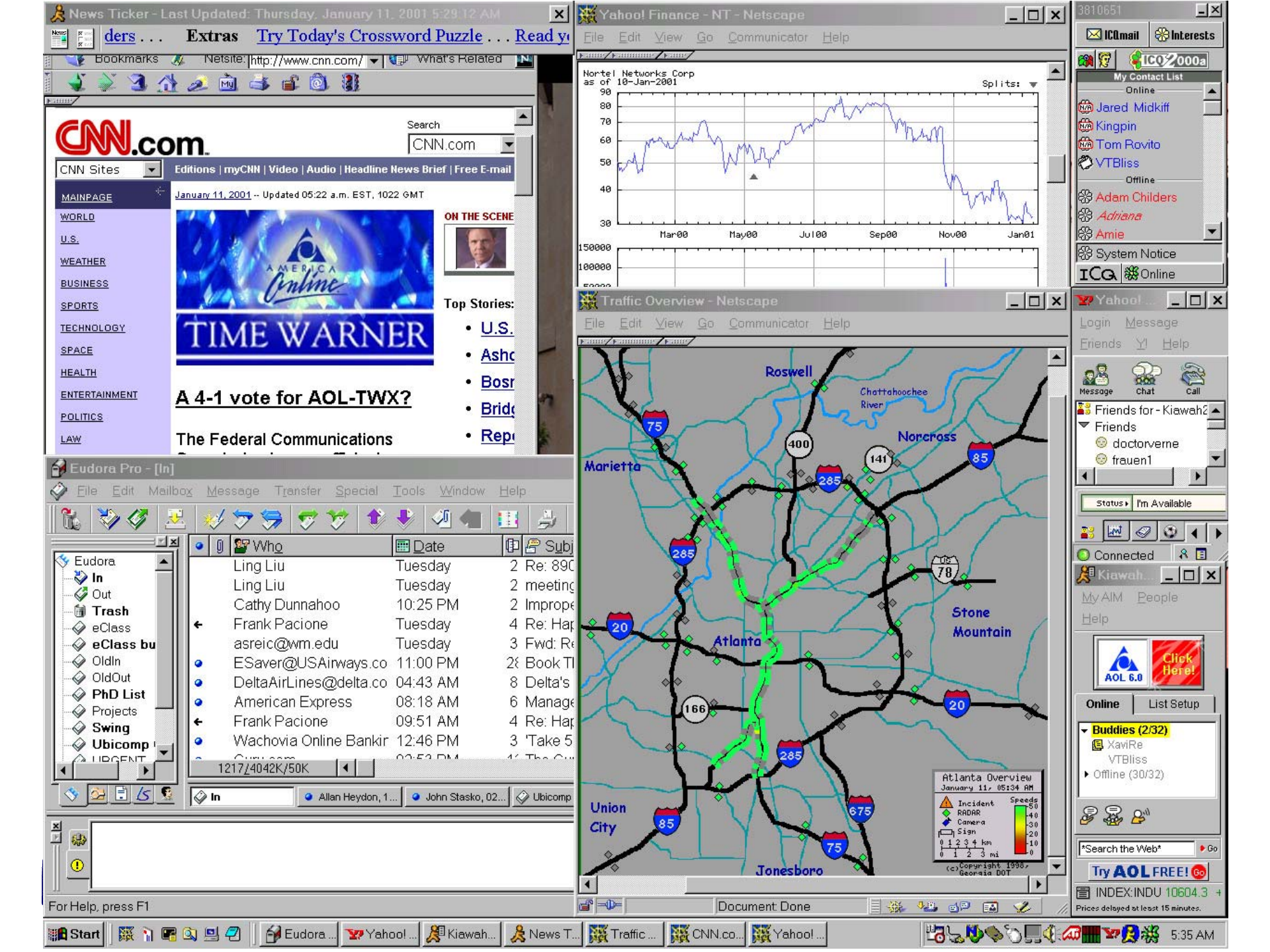
75 at Aviation Blvd

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,…


News Ticker - Last Updated: Thursday, January 11, 2001 5:29:12 AM
Extras
Try Today's Crossword Puzzle . . .
Bookmarks
Netsite: http://www.cnn.com/
What's Related
CNN.com
Search
CNN.com
CNN Sites
Editions | myCNN | Video | Audio | Headline News Brief | Free E-mail
MAINPAGE
WORLD
U.S.
WEATHER
BUSINESS
SPORTS
TECHNOLOGY
SPACE
HEALTH
ENTERTAINMENT
POLITICS
LAW
January 11, 2001 -- Updated 05:22 a.m. EST, 1022 GMT
AMERICA Online
TIME WARNER
ON THE SCENE
Top Stories:
A 4-1 vote for AOL-TWX?
The Federal Communications
Yahoo! Finance - NT - Netscape
File Edit View Go Communicator Help
Nortel Networks Corp
as of 10-Jan-2001
Splits:
90
80
70
60
50
40
30
Mar00
May00
Jul00
Sep00
Nov00
Jan01
150000
100000
3810651
ICQmail
Interests
ICQ 2000a
My Contact List
Online
Jared Midkiff
Kingpin
Tom Rovito
VTBliss
Offline
Adam Childers
Adriana
Amie
System Notice
ICQ
Online
Traffic Overview - Netscape
File Edit View Go Communicator Help
Roswell
Chattahoochee River
Norcross
Marietta
Atlanta
Stone Mountain
Union City
Jonesboro
75
400
141
85
285
20
78
166
675
Atlanta Overview
January 11, 05:34 AM
Incident
RADAR
Camera
Sign
Speeds
Yahoo!
Login
Message
Friends
Y!
Help
Message
Chat
Call
Friends for - Kiawah2
Friends
doctorverne
frauen1
Status
I'm Available
Connected
Kiawah...
My AIM
People
Help
AOL 6.0
Click Here!
Online
List Setup
Buddies (2/32)
XaviRe
VTBliss
Offline (30/32)
Search the Web
Go
Try AOL FREE!
INDEX:INDU 10604.3
Prices delayed at least 15 minutes.
Eudora Pro - [In]
File Edit Mailbox Message Transfer Special Tools Window Help
Eudora
In
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OldOut
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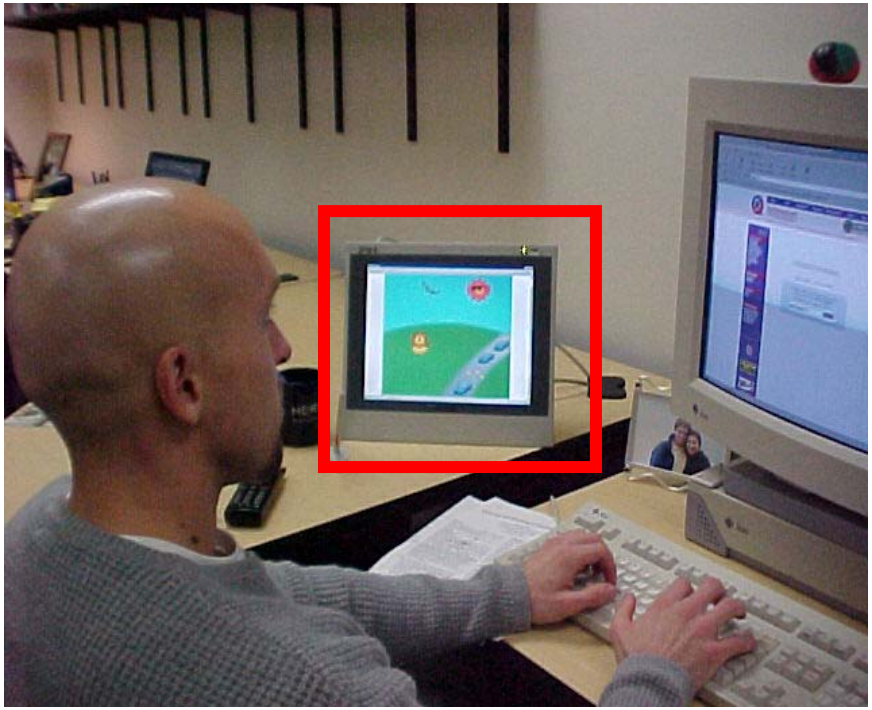
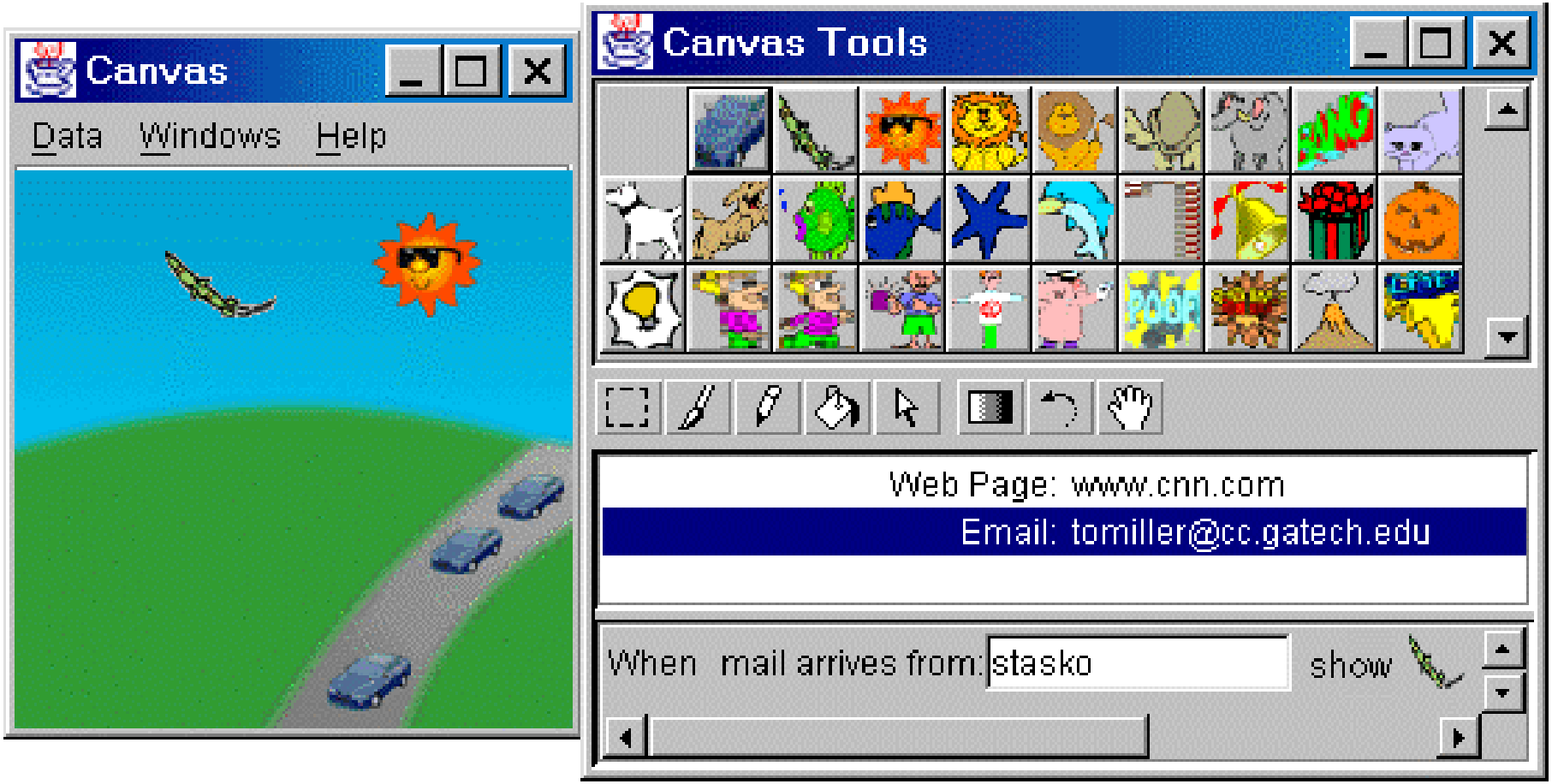
Swing
Ubicomp
Who
Date
Subj
Ling Liu Tuesday 2 Re: 890
Ling Liu Tuesday 2 meeting
Cathy Dunnahoo 10:25 PM 2 Impropе
Frank Pacione Tuesday 4 Re: Hap
asreic@wm.edu Tuesday 3 Fwd: Re
ESaver@USAirways.co 11:00 PM 2 Book Tl
DeltaAirLines@delta.co 04:43 AM 8 Delta's
American Express 08:18 AM 6 Manage
Frank Pacione 09:51 AM 4 Re: Hap
Wachovia Online Bankir 12:46 PM 3 'Take 5
1217/4042K/50K
In
Allan Heydon, 1...
John Stasko, 02...
Ubicomp
For Help, press F1
Document: Done
Start
Eudora ...
Yahoo! ...
Kiawah...
News T...
Traffic ...
CNN.co...
Yahoo! ...
5:35 AM

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



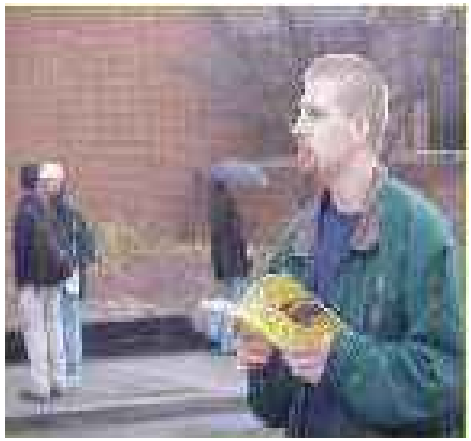
Status

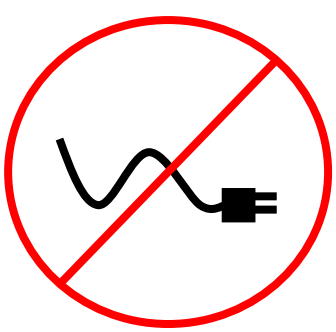
- Advanced prototype
  - Implemented in java and swing
  - Basic resources (mail and web) and basic painting interface functional
  - Working on more advanced capabilities
- Looking for artistic people to help!

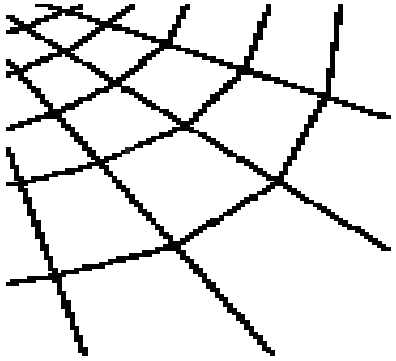
Small Screen Displays

Small Screen Displays

Design Scenarios

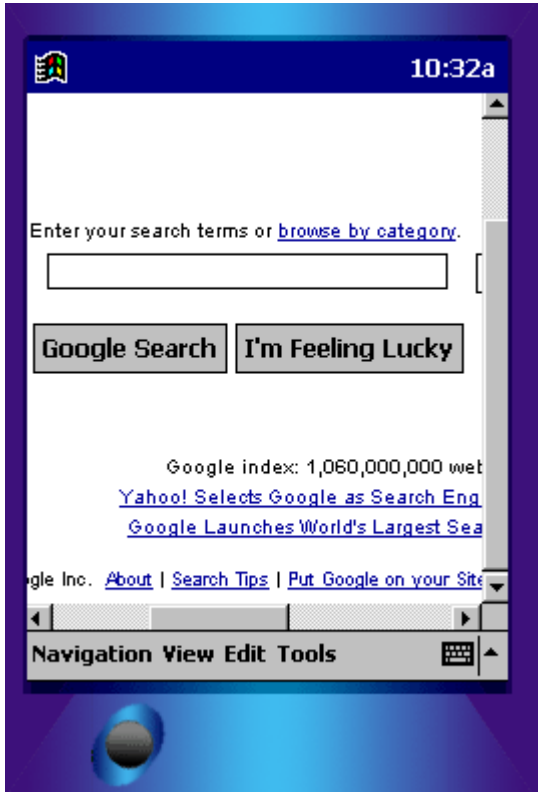






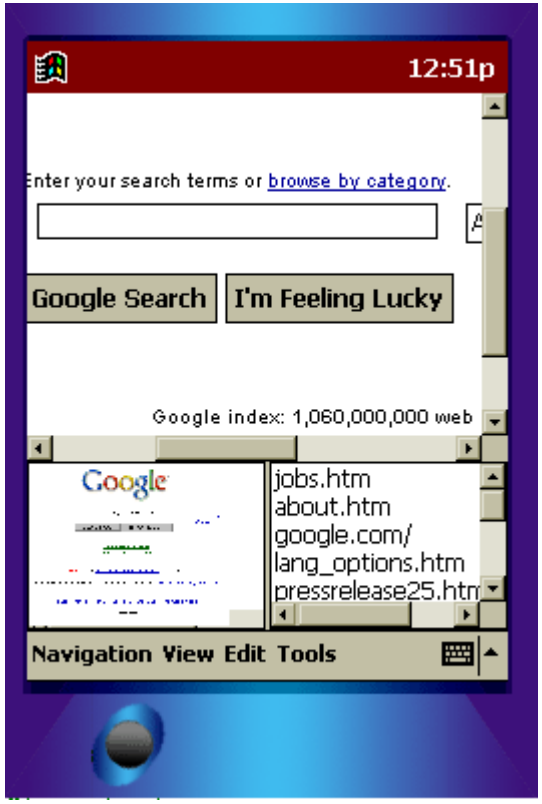
Wireless Web

Small Screen Displays

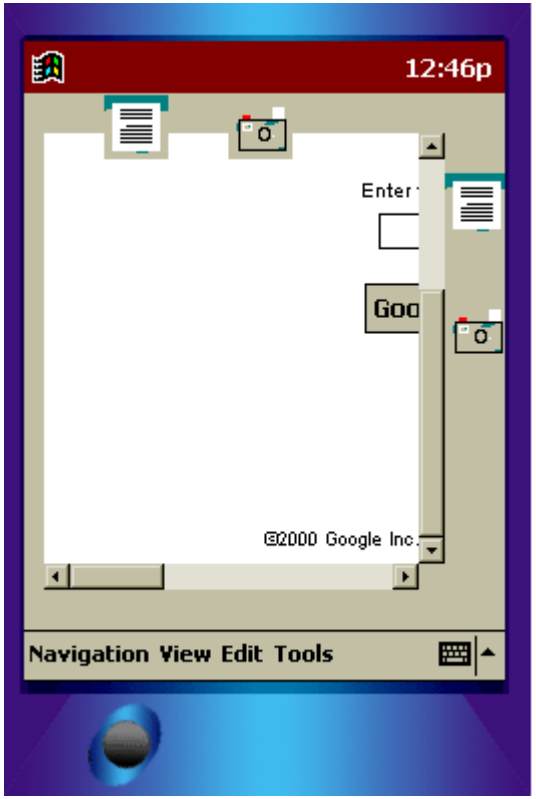


Normal View

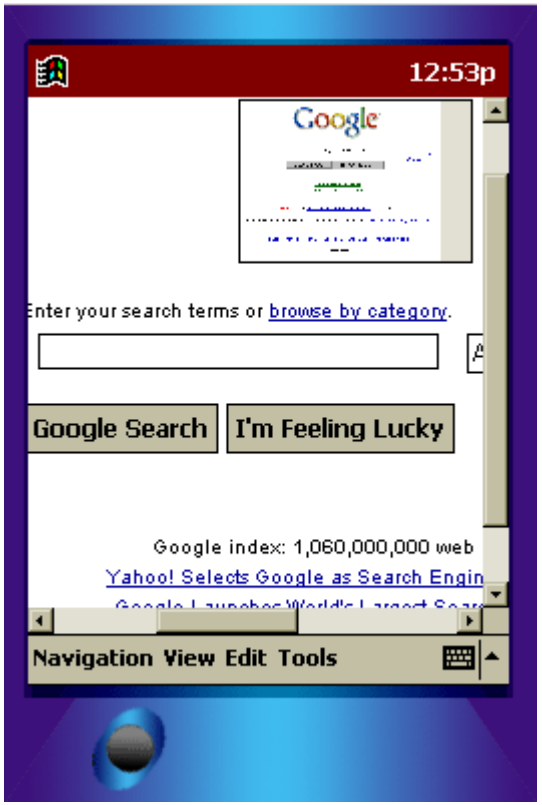
Small Screen Displays



Split View



Fisheye View

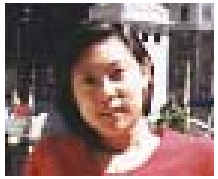


Overview

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



Ivy Ho

- 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

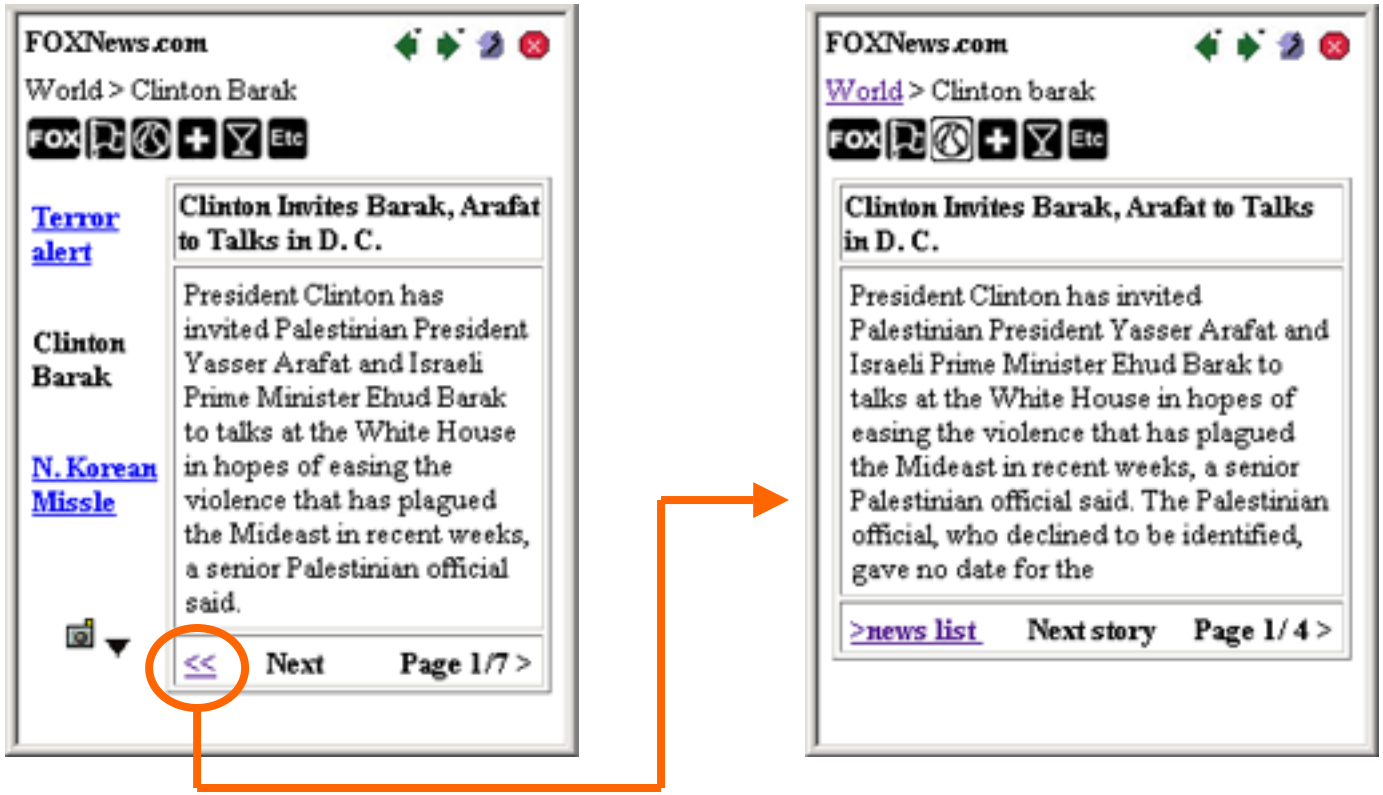
List of News topics under "World" category

Display a particular news content

Alternate Design

Optional to display news topics as either keywords or image thumbnails

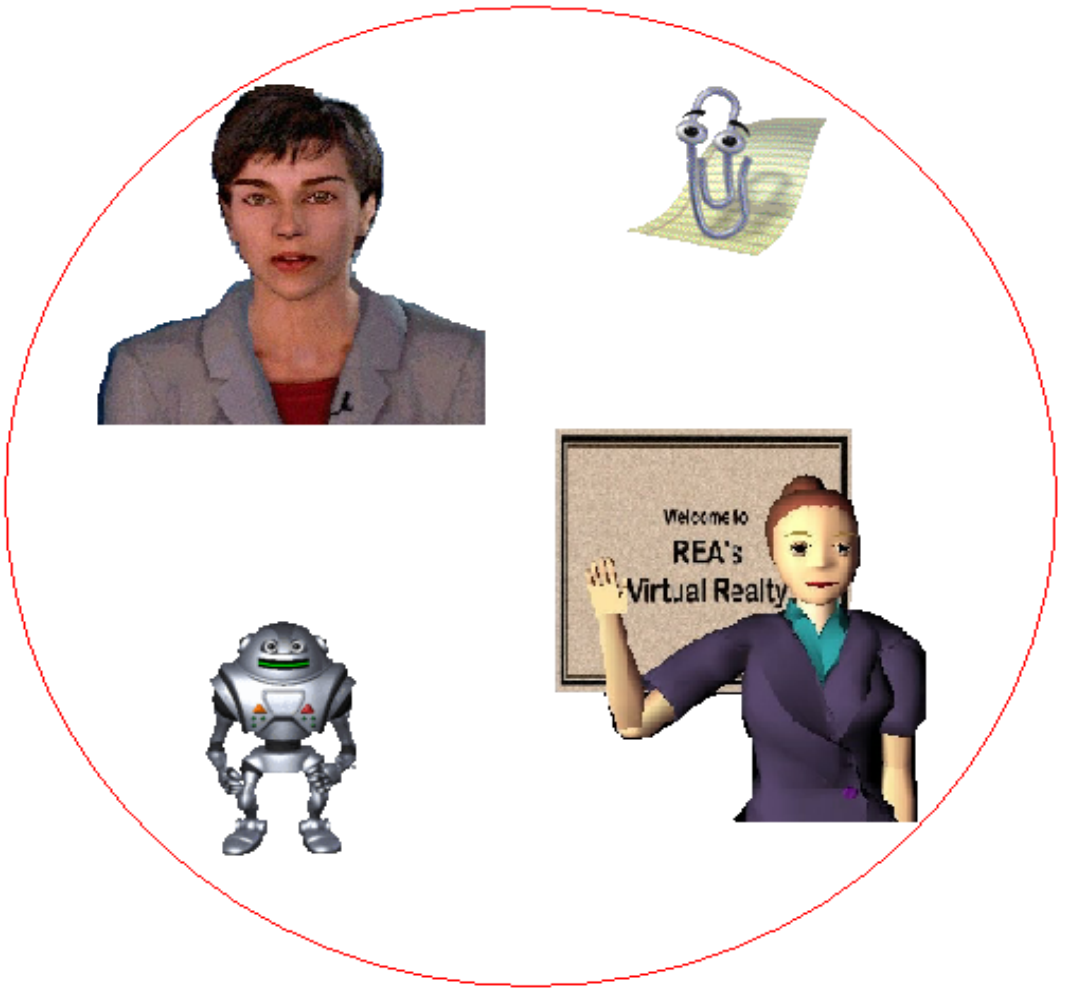
Expandable space to view news content



Current Status

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

Anthropomorphic UI Agents



Cons

- distract users
- reduce control

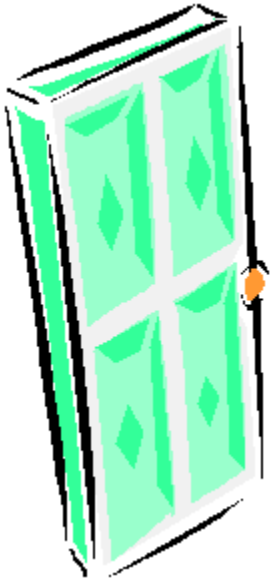
Pros

- 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?

Experimenter



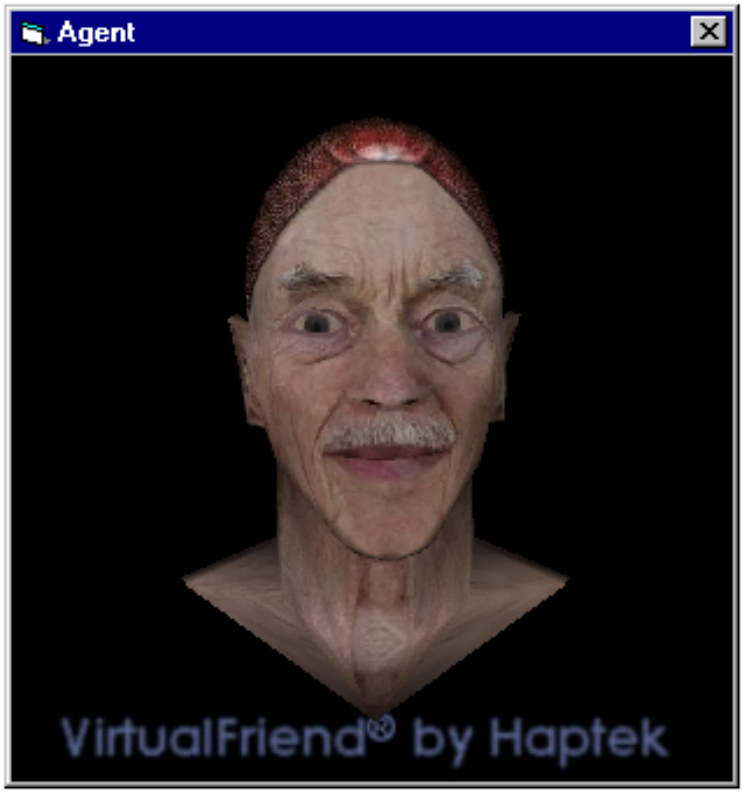
Participant

Want to factor out (in)competence as an issue

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.

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

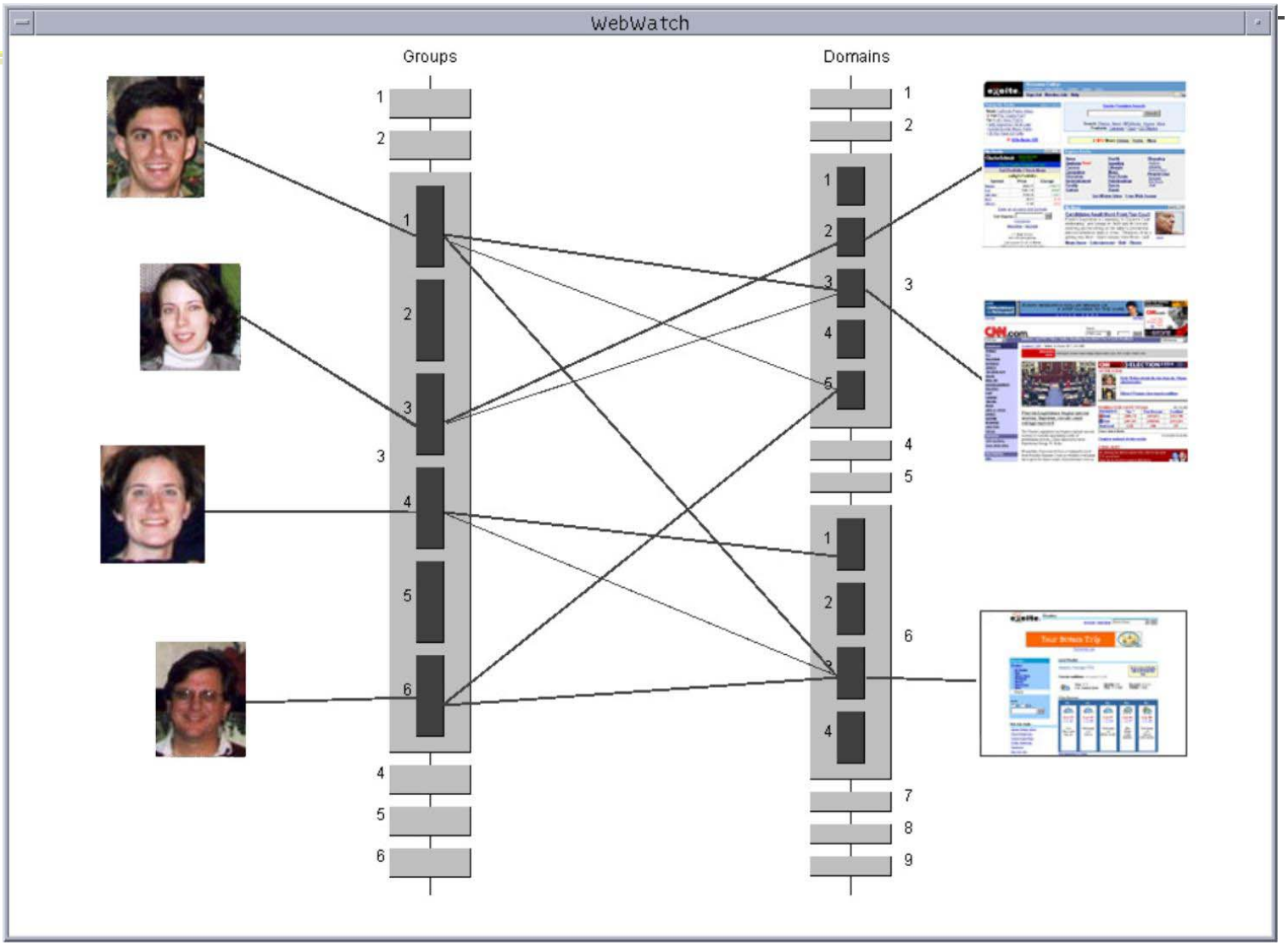
- Explore social implications
  - Do colleagues at work visit web pages that may interest me?
  - What kinds of people visit these pages, and how often?
- "Group bookmarks"
  - Shared list of pages useful to people in a certain group
  - Users choose to subscribe to particular groups based on their interests

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

Personal Information Management

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!!!

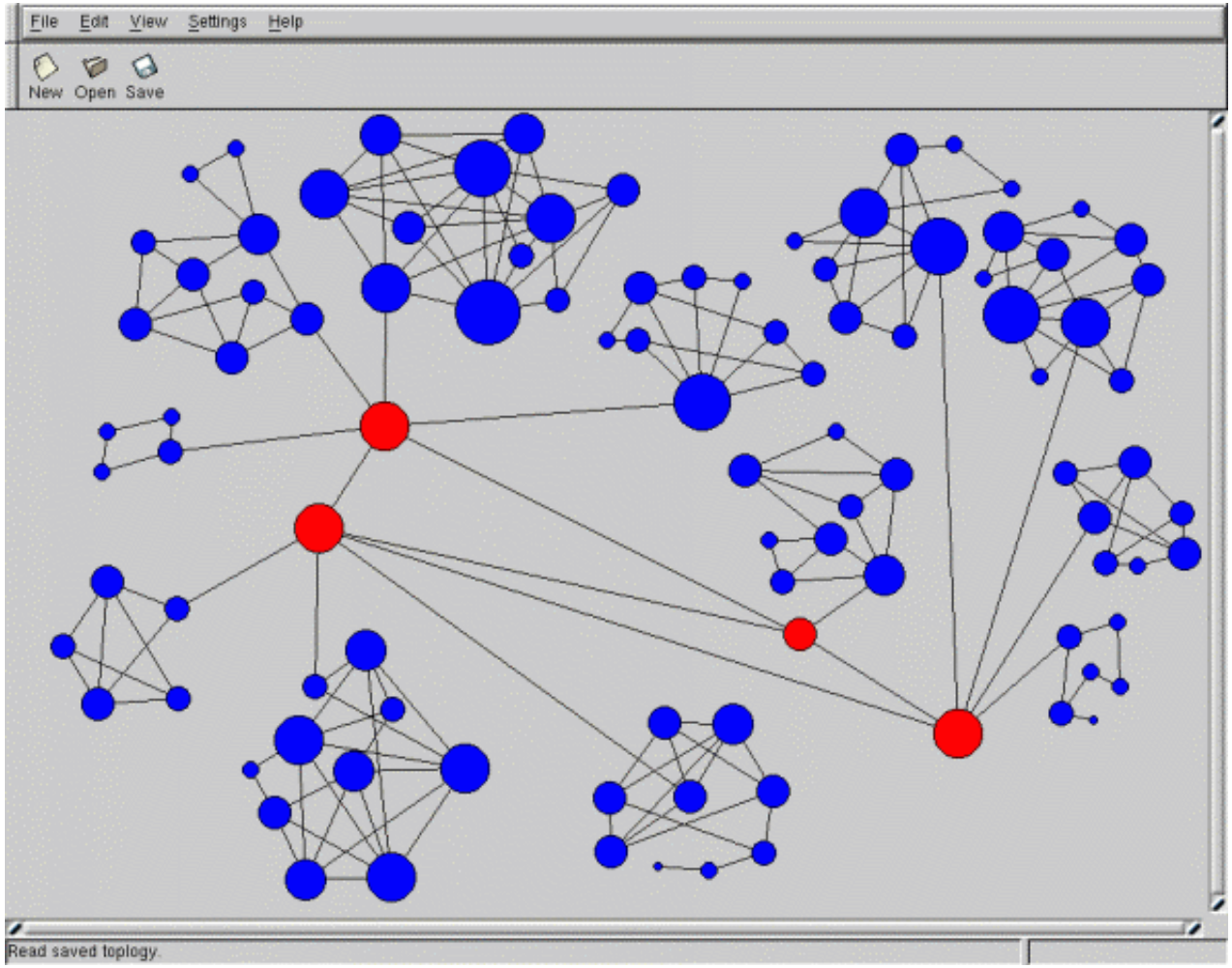
An interactive, peripheral visual application that aids information management.

James Eagan

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


File Edit View Settings Help
New Open Save
Read saved topology.

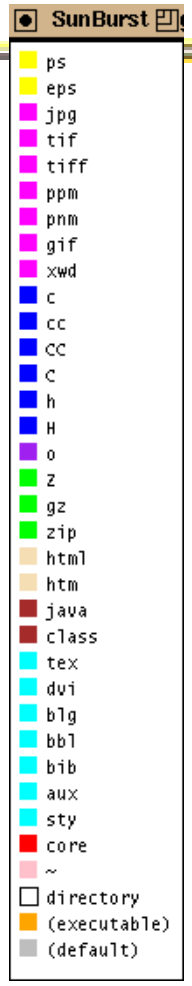
Challenges

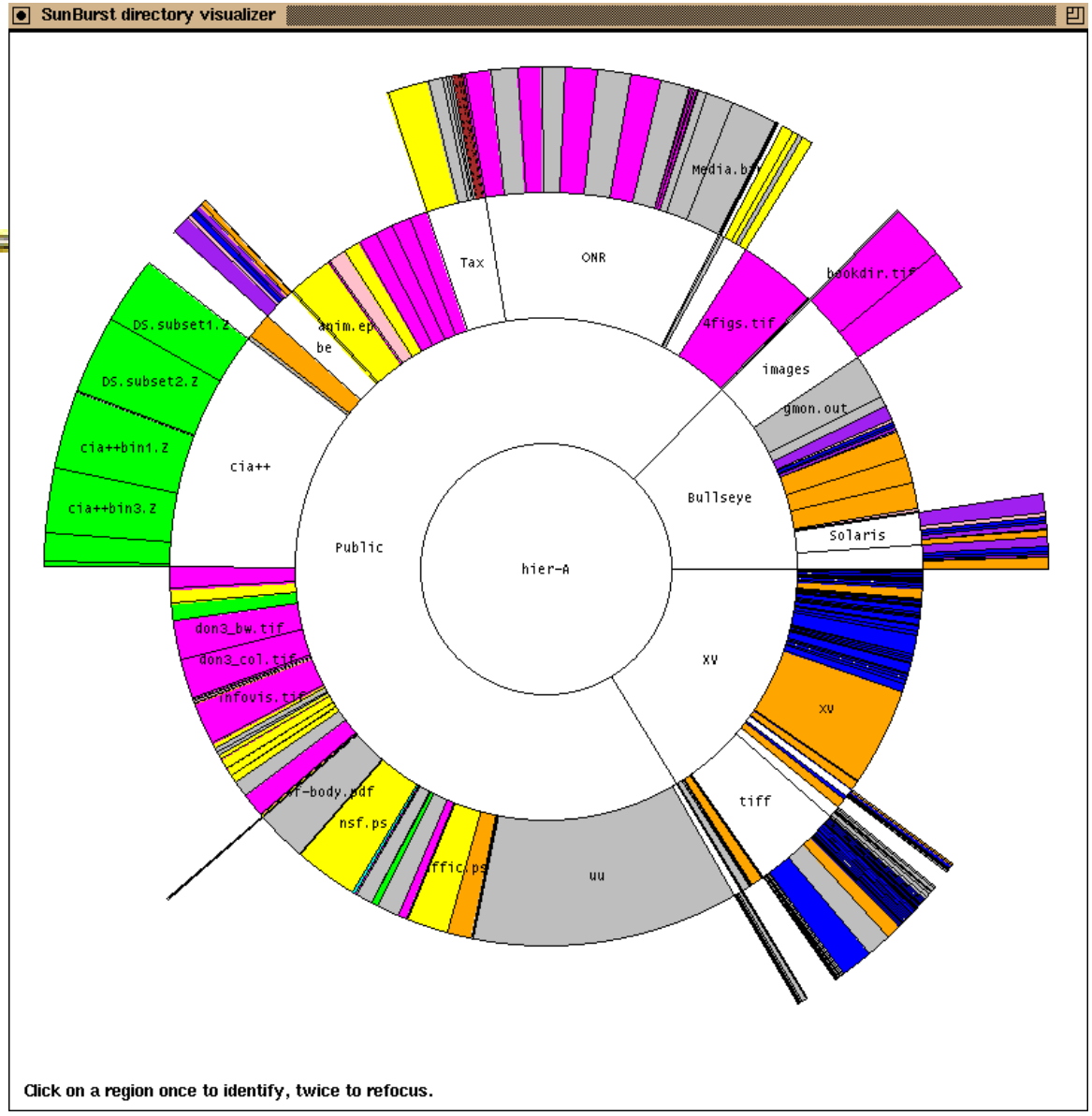
- Scalability
- Graph layout
- Layout manipulation

Sunburst

Visualizing file and directory structures

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

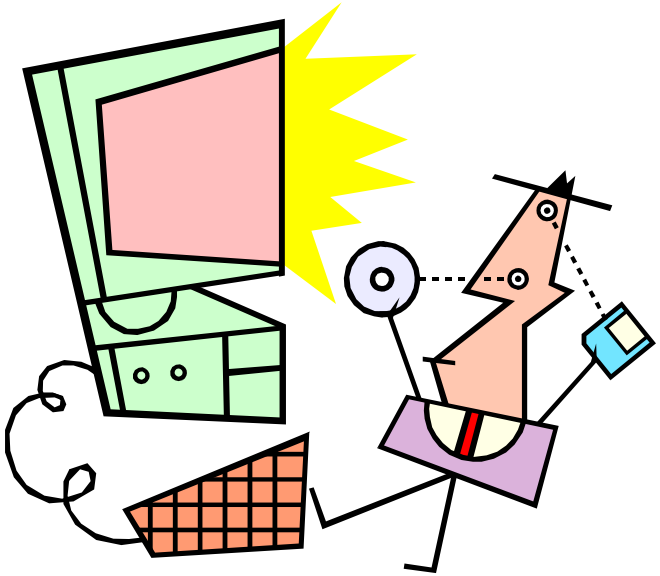




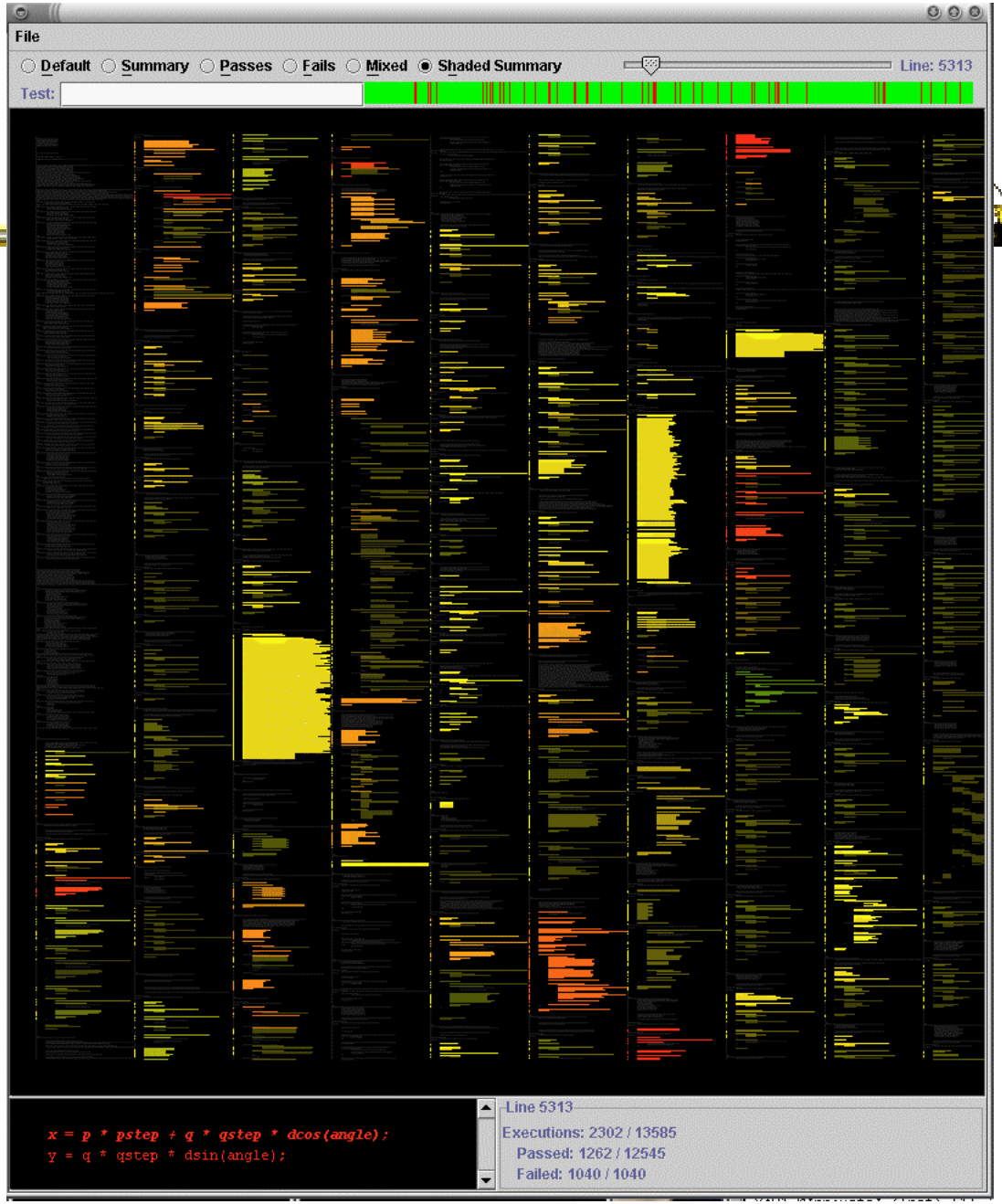
On Solaris: **`/usr/local/public/bin/sunburst`**

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



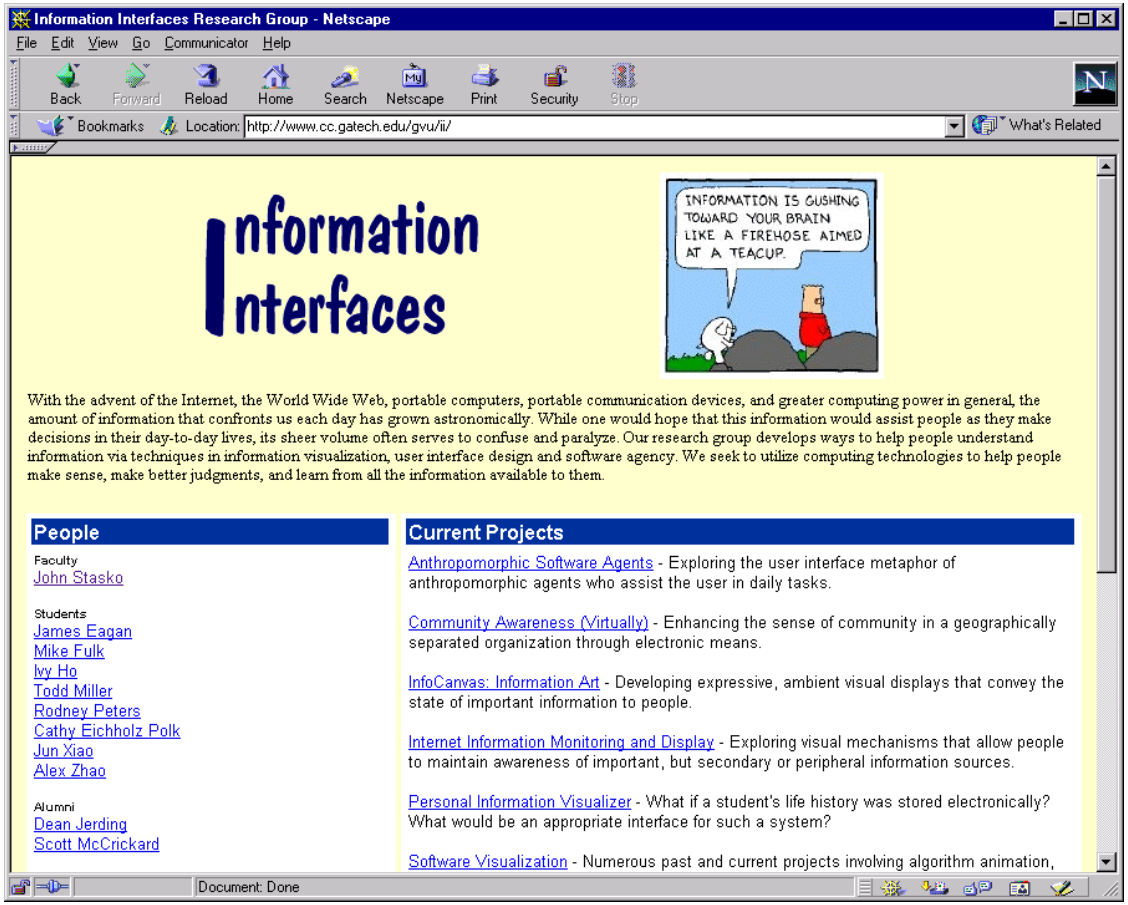
Tarantula system

Visualization of program run against a suite of test inputs

Seeking to assist fault localization

With Prof. MJ Harrold, Jim Jones, James Eagan

Information Interfaces

For More Information...

- www.cc.gatech.edu/gvu/ii