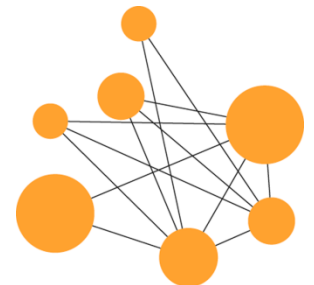
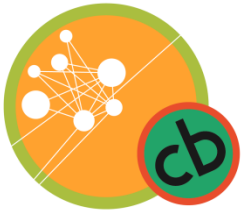


Visual Analytics

Carsten Görg

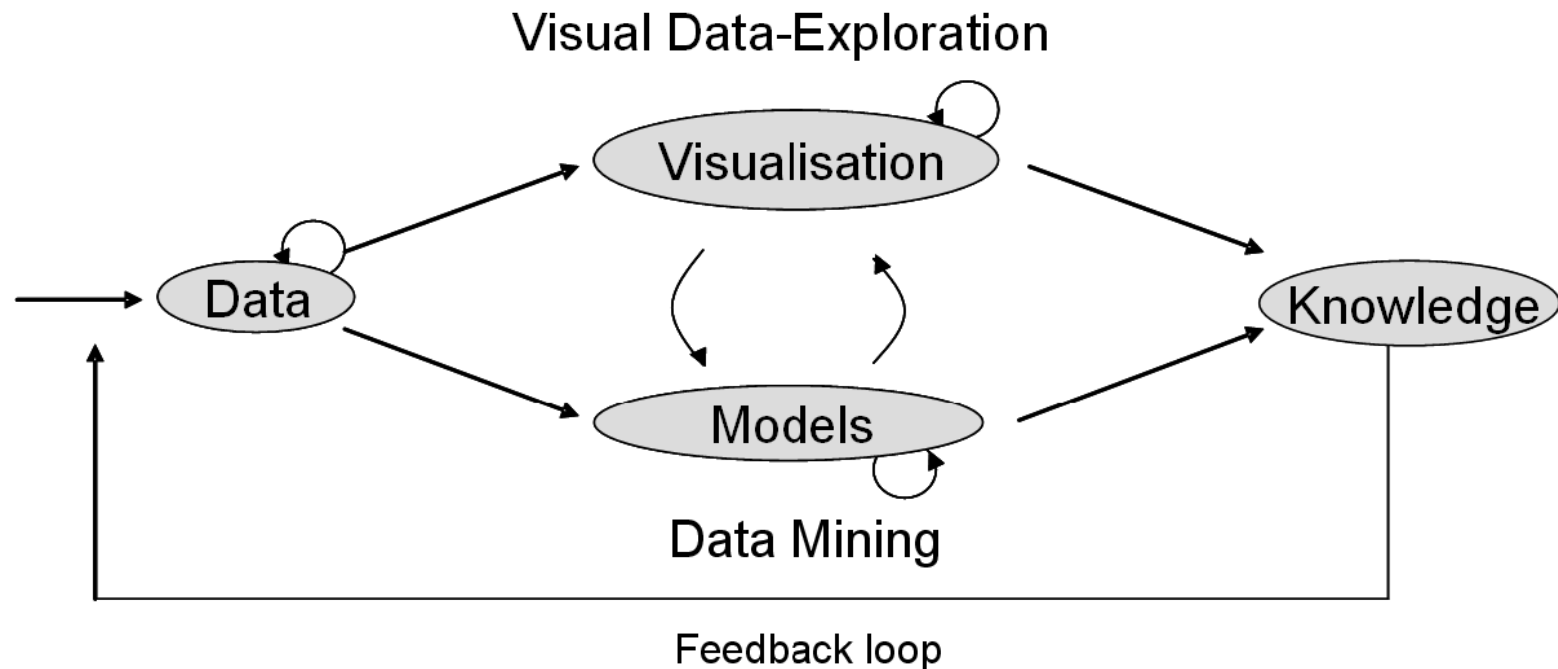
University of Colorado Denver

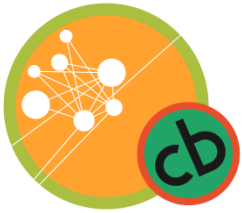




Visual Analytics

Tight integration of visual and automatic data analysis methods with database technology for a scalable interactive decision support.





Visual Analytics

Visual analytics integrates scientific disciplines to improve the division of labor between the human and the machine.

Machine

Statistical Analysis

Data Mining

Data
Management

Compression &
Filtering

Semantics-based
approaches

Human-centered
computing

“The best of both sides”

Information Visualization

Graphics and Rendering

Human

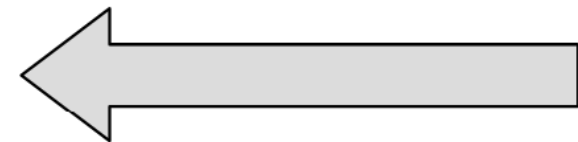
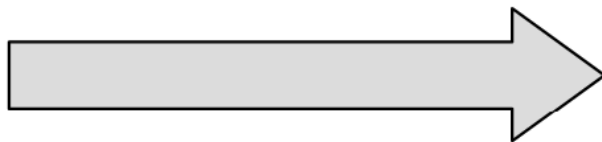
Human Cognition

Perception

Visual
Intelligence

Information
Design

Decision Making
Theory



know your user

know your user's mental model

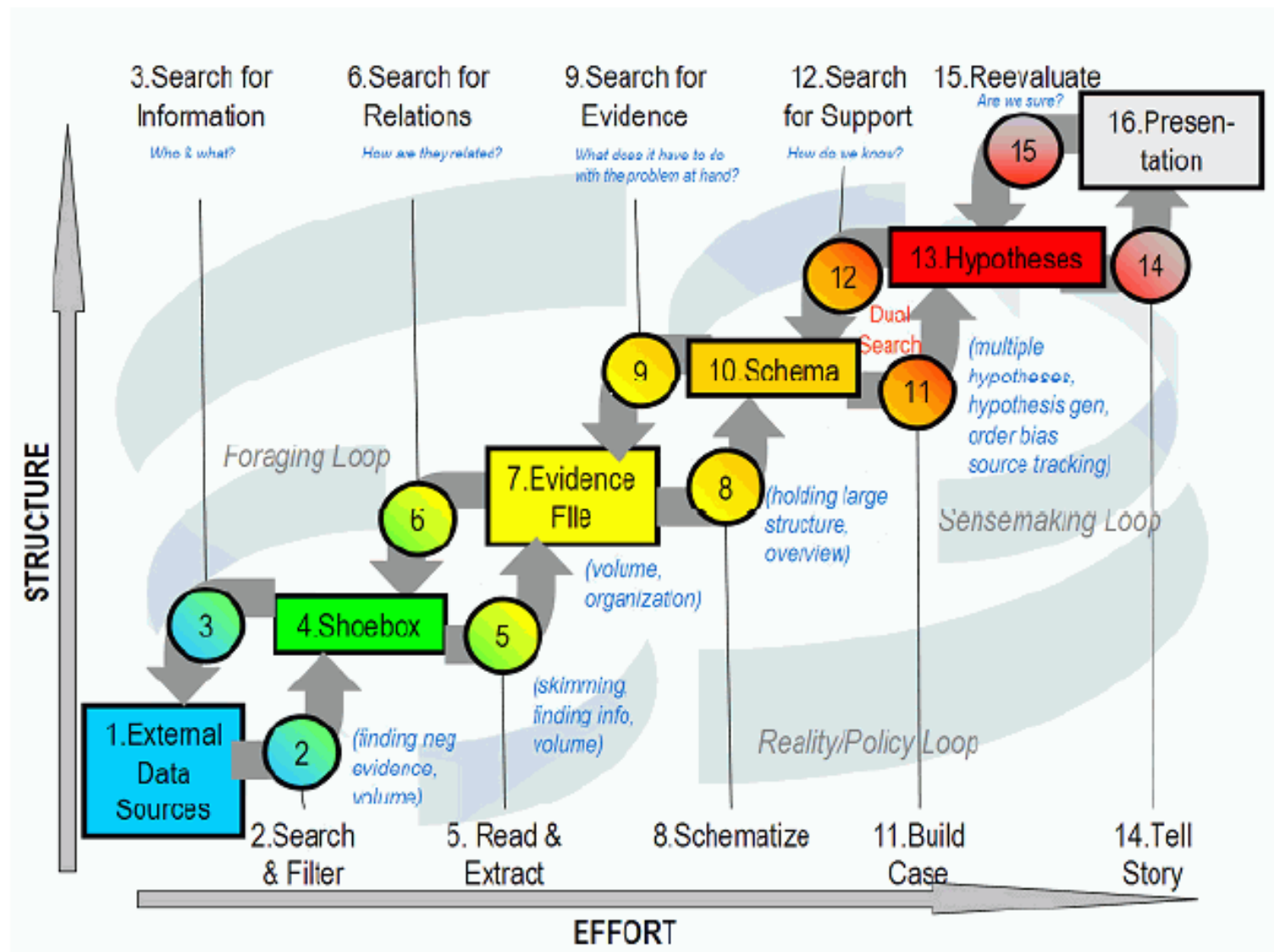
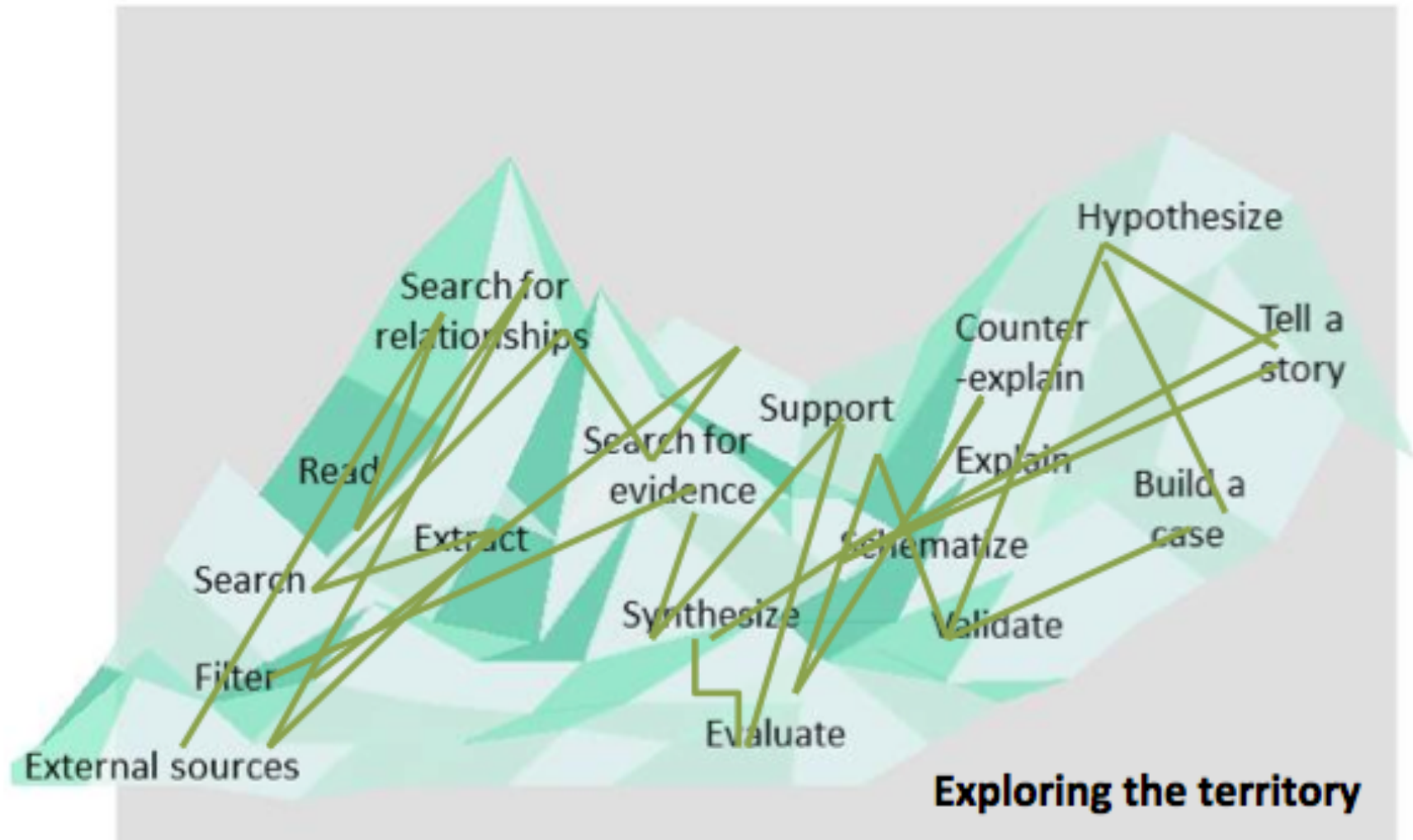


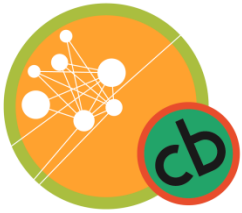
Figure 2.1. Notional model of sensemaking loop for intelligence analysis derived from CTA.

Pirolli & Card, ICIA '05

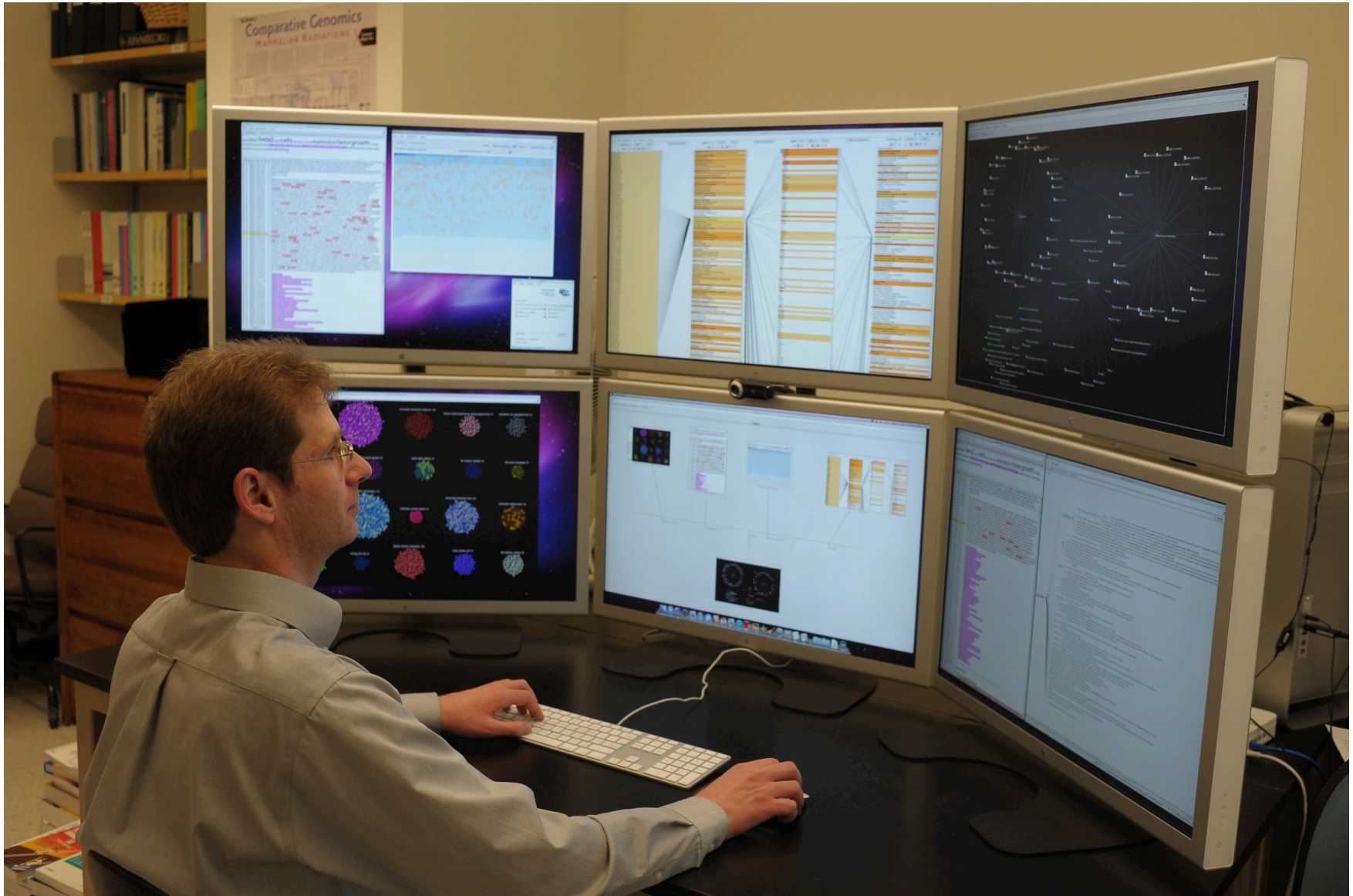


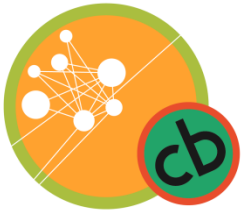
B. Mirel: Interaction design for complex problem solving:
Developing useful and usable software (Elsevier, 2004).

pixels are precious



“Six Pack”





Powerwall at Konstanz University



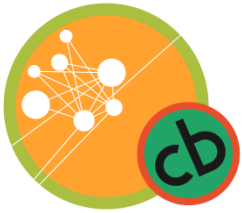


North lab, Virginia Tech

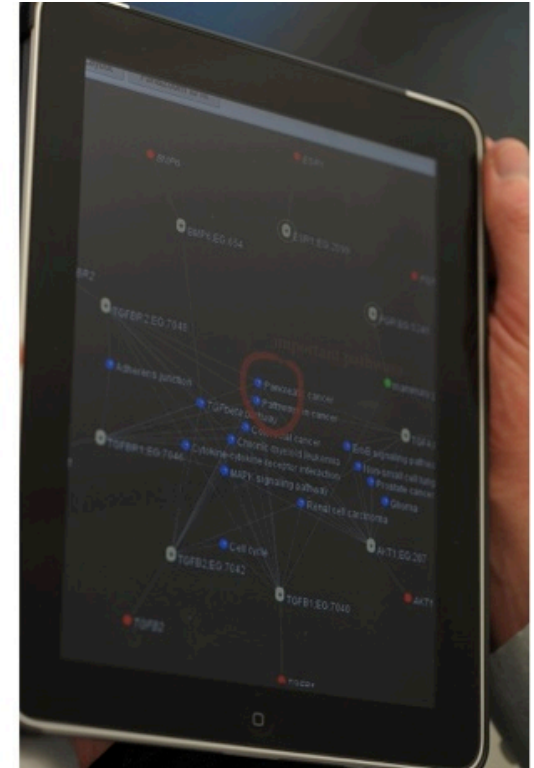
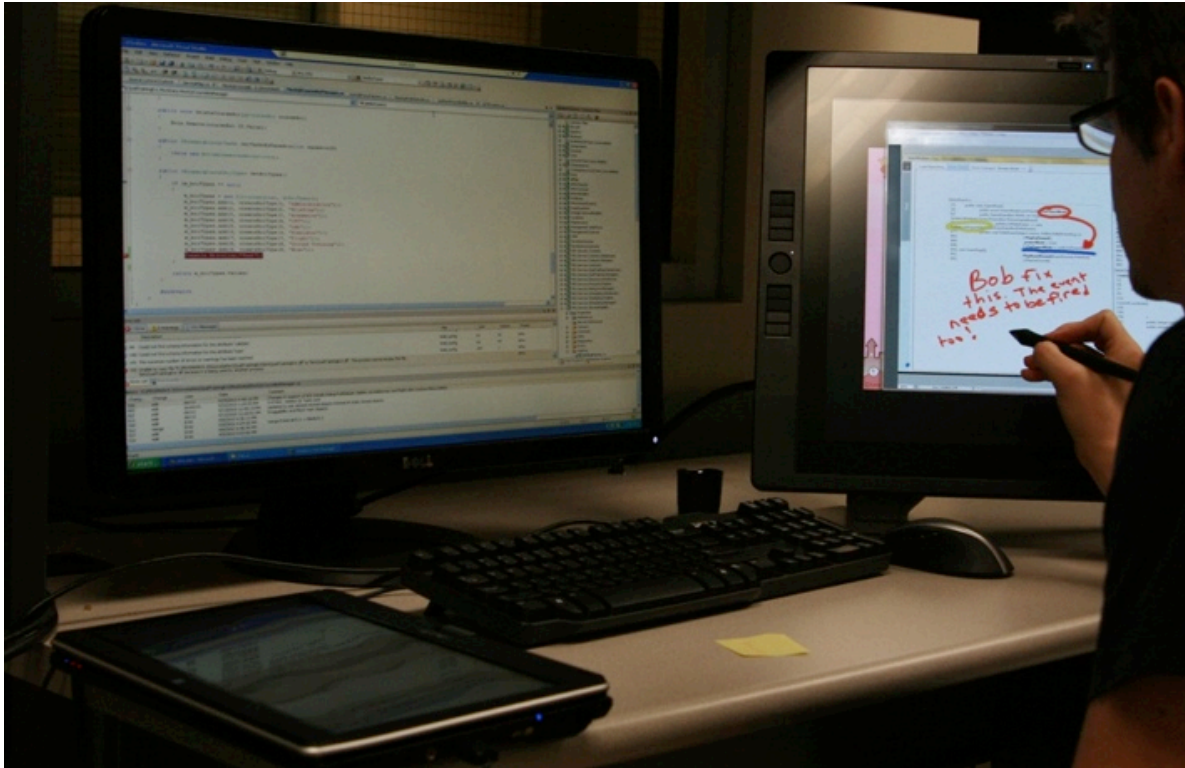


C. Andrews et al., "Space to think: large high-resolution displays for sensemaking" CHI '10

(don't) touch me



Cintiq (pen) and iPad (touch)



evaluation is important
(and difficult)

Word Tree View

Edit Bookmarks

<< Back Forward >> Tamoxifen

74 matches

tamoxifen

- is
 - a
 - synthetic nonsteroidal antiestrogen,
 - chemotherapeutic agent and estrogen receptor antagonist used in the treatment of breast cancer
 - an anti-estrogen receptor, inhibits P-glyc signaling in estrogen-negative and estrogen-receptor-independent cancer cell lines
 - and EGFRs were shown to protect normal astrocyte components from camptothecin-induced neuronal cell death, effects that were attenuated by G1527260, ATR inhibitors, or its
 - are well established as breast cancer treatment
 - but the role of TGF- α in the resistant phenotype is unclear
 - new metabolites and explored whether it correlated with their capacity to induce TGF β 2 and TGF β 1 expression, metabolites
 - and mRNA expression of TGF β 2 and TGF β 1 was analyzed by quantitative RT-PCR in breast cancer cells
 - however, we examined candidate genes using a RT-PCR strategy to identify novel biomarkers of endocrine resistance,
 - that TGF- α may degrade the mechanism, thus contributing to tamoxifen resistance
 - decreasing fibroblast function and downregulating TGF β 1
 - inactive but in ERK-deficient mice
 - in
 - who was not altered by TGF- α mRNA reducing antibodies
 - one of the most successful drugs in the endocrine treatment of breast cancer
 - transformed by polymorphic and inducible cyclin-dependent kinase P420 enzymes to a large variable and at least partially due to highly complex metastasis
 - is
 - a
 - metabolites
 - and mRNA expression of TGF β 2 and TGF β 1 was analyzed by quantitative RT-PCR in human squamous cell carcinoma lines of the head and neck
 - on
 - the secretion of transforming growth factor- β 2 (TGF β 2) in glioblastoma
 - transcriptional level of transforming growth factor- β 2 (TGF β 2) isoforms 1 and 2
 - by TGF- β 2 antibodies did not occur in glioblastoma mice, which lack of human breast carcinomas in vivo by neutralizing antibodies to p18
 - resistance
 - is a well tolerated component in the treatment of metastatic and primary breast cancer
 - a control antibody conferred no proliferate
 - plus
 - TGF- β 2 antibodies failed to proliferate, whereas tumors treated with tamoxifen + TGF- β 2 antibodies showed a decrease in proliferation
 - significantly
 - decreased fibroblast activity by decreasing conversion of the free, unbound ligand to the active complex
 - (n=24) compared with samples from patients who did not (n=24)
 - has been demonstrated to decrease the function of fibroblasts during induction of TGF- β 2 mRNA expression and the ER- α up to 10% decrease in proliferation of TGF- β 2 mRNA level was considered to predict (n=10) increased both the expression and release of the neuroprotective cytokine, TGF- β 1 in breast cancer is believed to be mediated in part by regulation of transforming growth factor- β 1 (TGF- β 1) expression and protein activities of matrix metalloproteinases (MMPs) also inhibited the mRNA expression and protein activities of matrix metalloproteinases (MMPs) also caused a decreased contractile force in both Duoyuan's affected fibroblasts and capillary endothelial cells
 - decreased TGF β 1 expression in Duoyuan's affected fascia group but not in the control group
 - decreased fibroblast function and downregulated TGF β 2 in duoyuan's affected paracrine cells
 - provided clinical applications for the treatment of tumor cell metastasis
 - related
 - inhibited tumor cell invasion and metastasis in mouse melanoma cell line B16BL3
 - inhibits tumor cell invasion and metastasis in mouse melanoma through suppression of p18

Document Cluster Endview

1. Gene description: 26

2. cellproliferation,act: 5

3. growth_factor,relat: 23

4. factor,neuronal,trans: 1

5. cellLumines: 92

6. express,genes: 46

7. cellGrowth: 798

8. growth_factor,act: 290

9. growth_factor,relat: 290

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11. growth_factor,act: 290

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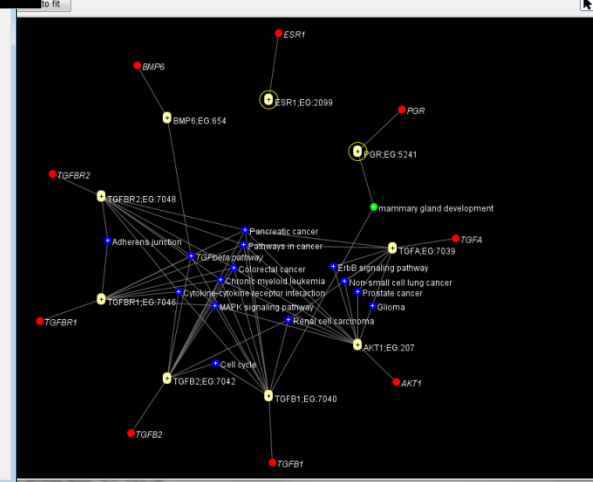
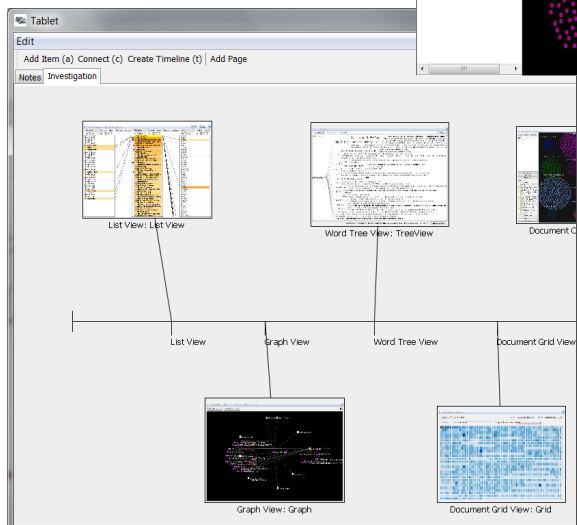
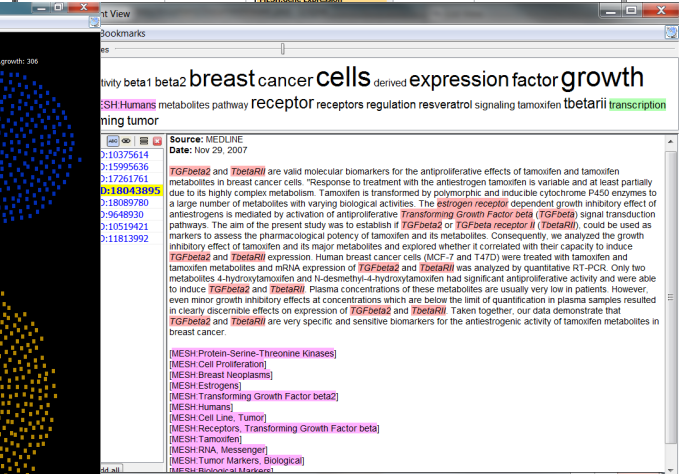
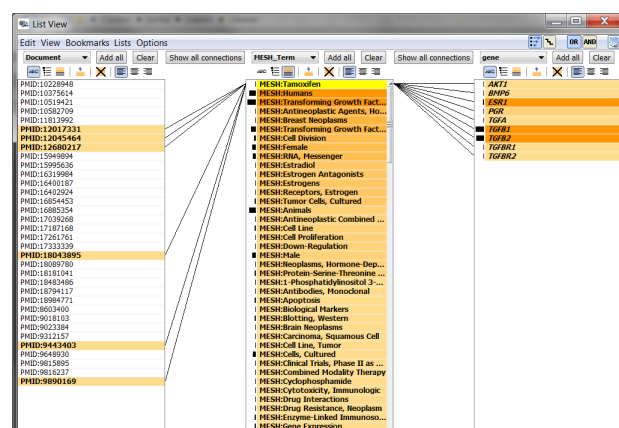
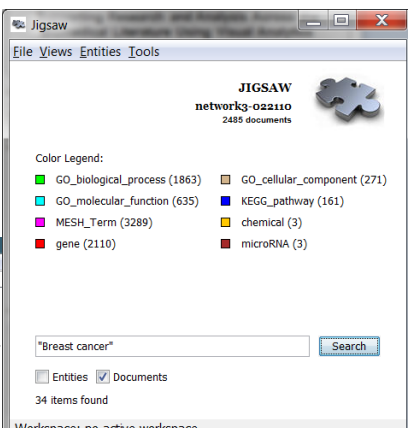
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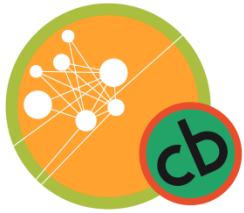
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146. growth_factor,act: 290

147. growth_factor,act: 290

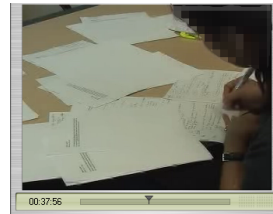
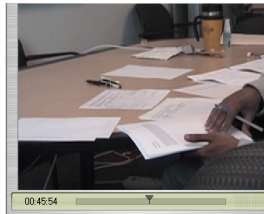
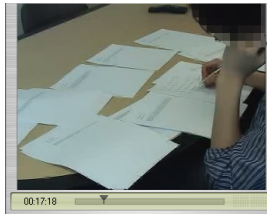
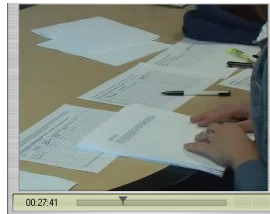
148. growth_factor,act: 29



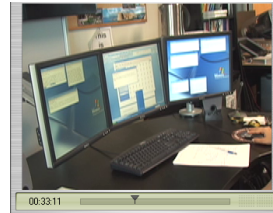
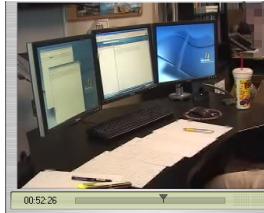
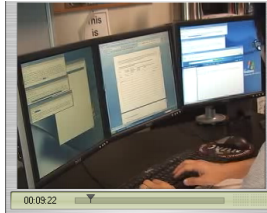
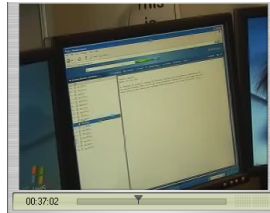


Controlled lab study with 4 settings

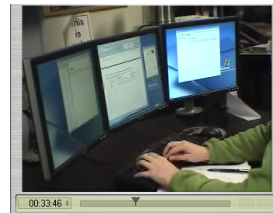
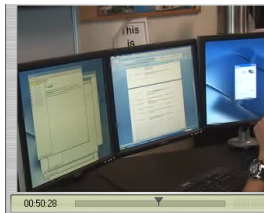
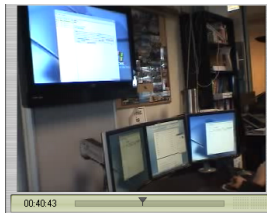
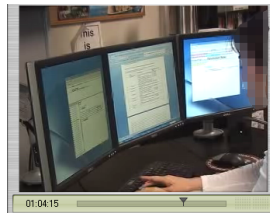
Paper



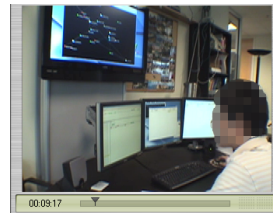
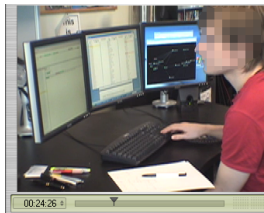
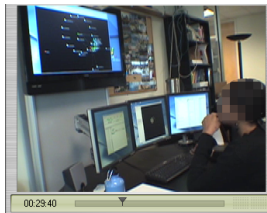
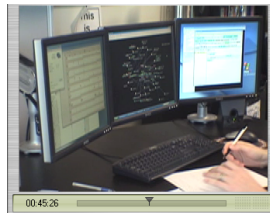
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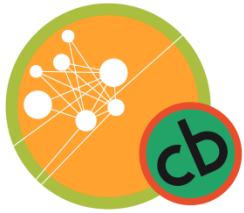


Entity

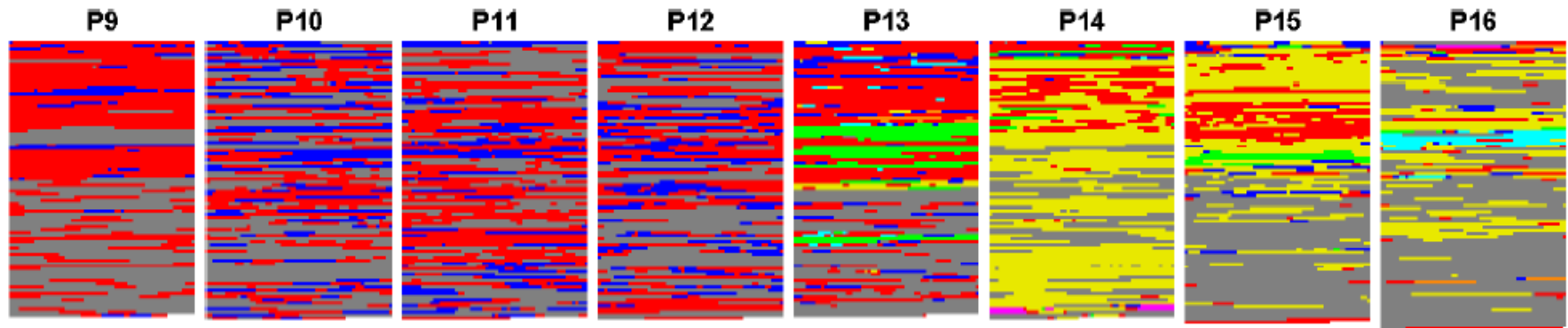


Jigsaw

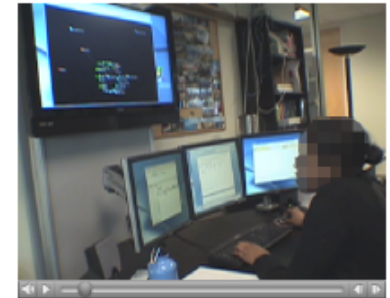
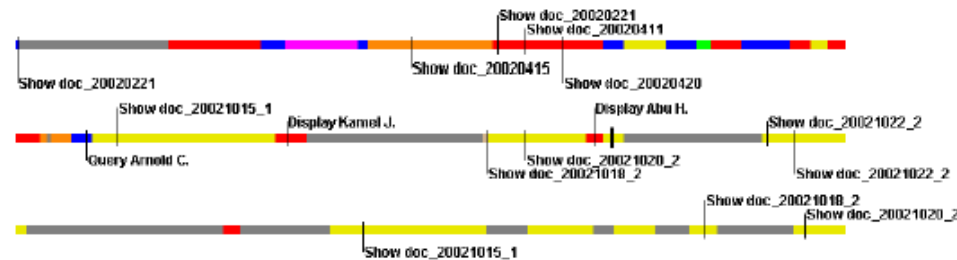


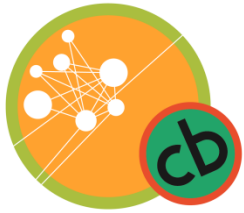


Using visualization for analyzing study results



Main View
Document View
List View
Graph View
Calendar View
Document Cluster View
Timeline View
Task Sheet

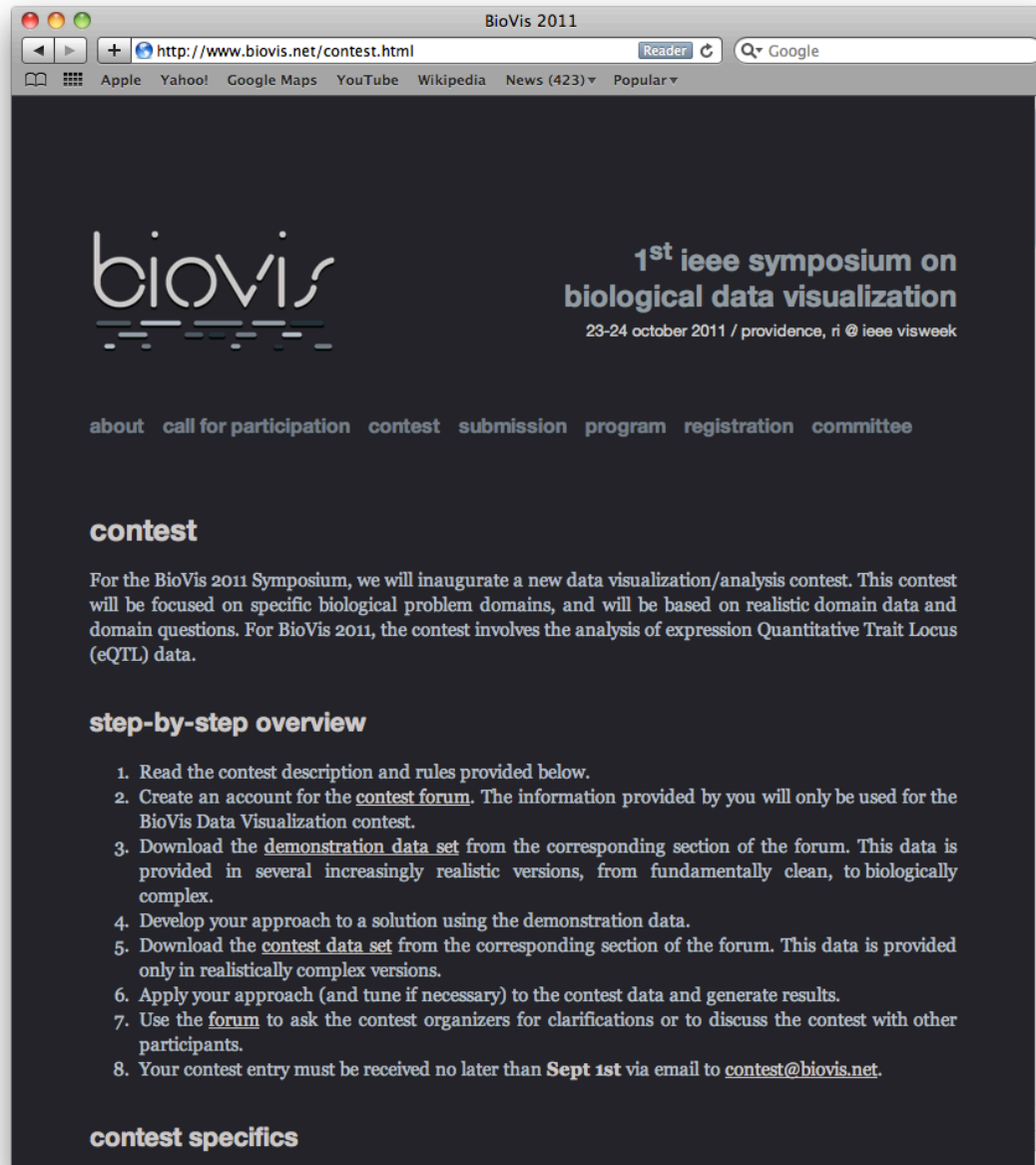




4 Strategies:
 Overview, filter & detail
 Build from detail
 Hit the keyword
 Find a clue, follow the trail

	Paper				Desktop				Entity				Jigsaw			
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16
Grading Task Sheet	-1.75	17	4	13	13	10.5	10.5	-3.5	5.5	-8.25	4	7.5	14.5	13.5	7	17
Grading Debriefing	2	2.5	1	5.5	3	4	1.5	3	3.5	2.5	1.5	6	6	2.5	5.5	5
Final Score	22.87	65.00	24.26	87.08	62.08	67.13	42.13	29.41	52.23	15.00	29.26	81.19	95.05	58.07	75.20	90.00
Performance	fair	very good	fair	excellent	very good	very good	good	fair	good	poor	fair	excellent	excellent	good	very good	excellent
Avg. Score/Setting	49.80				50.19				44.42				79.59			
Documents Viewed	50	50	50	50	50	50	50	50	49	31	45	50	31	50	46	23
Number of Queries					19	18	48	8	23	61	59	91	44	4	26	8
First Query					40:49	19:55	2:47	12:41	1:31	0:29	0:59	3:12	0:18	5:35	25:37	4:18
Amount of Notes	many	none	many	some	many	some	few	some	some	none	none	few	some	few	few	few
First Note Taking	0:07	—	0:05	0:16	1:53	19:57	2:47	8:20	2:37	—	—	3:14	0:48	0:32	5:15	78:48
First Task Sheet	43:20	32:53	70:13	3:25	61:35	20:26	7:33	64:11	28:09	0:52	2:55	7:20	48:26	41:48	43:00	5:33
Strategy Used	OFD	OFD	BFD	OFD	OFD	OFD	FCFT	BFD	BFD	HTK	HTK	FCFT	FCFT	HTK	OFD	FCFT

IEEE BioVis Contest



The image is a screenshot of a web browser displaying the IEEE BioVis 2011 contest page. The browser window has a title bar that says "BioVis 2011". The address bar shows the URL "http://www.biovis.net/contest.html". Below the address bar is a navigation bar with links to "Apple", "Yahoo!", "Google Maps", "YouTube", "Wikipedia", "News (423)", and "Popular". The main content area has a dark background. On the left, there is a logo for "biovis" with horizontal lines underneath. On the right, the text reads "1st ieee symposium on biological data visualization" and "23-24 october 2011 / providence, ri @ ieee visweek". Below this is a horizontal menu with links: "about", "call for participation", "contest", "submission", "program", "registration", and "committee". The "contest" link is highlighted. The main heading is "contest". The text below it says: "For the BioVis 2011 Symposium, we will inaugurate a new data visualization/analysis contest. This contest will be focused on specific biological problem domains, and will be based on realistic domain data and domain questions. For BioVis 2011, the contest involves the analysis of expression Quantitative Trait Locus (eQTL) data." Below this is a section titled "step-by-step overview" followed by a numbered list of 8 steps. The first step is "1. Read the contest description and rules provided below." The second step is "2. Create an account for the [contest forum](#). The information provided by you will only be used for the BioVis Data Visualization contest." The third step is "3. Download the [demonstration data set](#) from the corresponding section of the forum. This data is provided in several increasingly realistic versions, from fundamentally clean, to biologically complex." The fourth step is "4. Develop your approach to a solution using the demonstration data." The fifth step is "5. Download the [contest data set](#) from the corresponding section of the forum. This data is provided only in realistically complex versions." The sixth step is "6. Apply your approach (and tune if necessary) to the contest data and generate results." The seventh step is "7. Use the [forum](#) to ask the contest organizers for clarifications or to discuss the contest with other participants." The eighth step is "8. Your contest entry must be received no later than **Sept 1st** via email to contest@biovis.net." Below the list is a section titled "contest specifics".

BioVis 2011

http://www.biovis.net/contest.html

Reader

Google

Apple Yahoo! Google Maps YouTube Wikipedia News (423) Popular

biovis

1st ieee symposium on
biological data visualization

23-24 october 2011 / providence, ri @ ieee visweek

about call for participation contest submission program registration committee

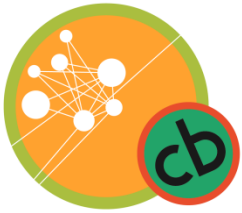
contest

For the BioVis 2011 Symposium, we will inaugurate a new data visualization/analysis contest. This contest will be focused on specific biological problem domains, and will be based on realistic domain data and domain questions. For BioVis 2011, the contest involves the analysis of expression Quantitative Trait Locus (eQTL) data.

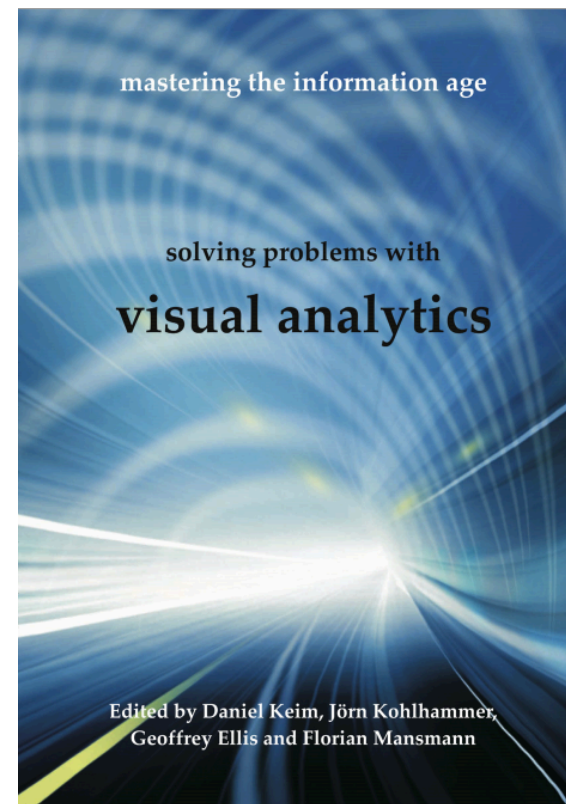
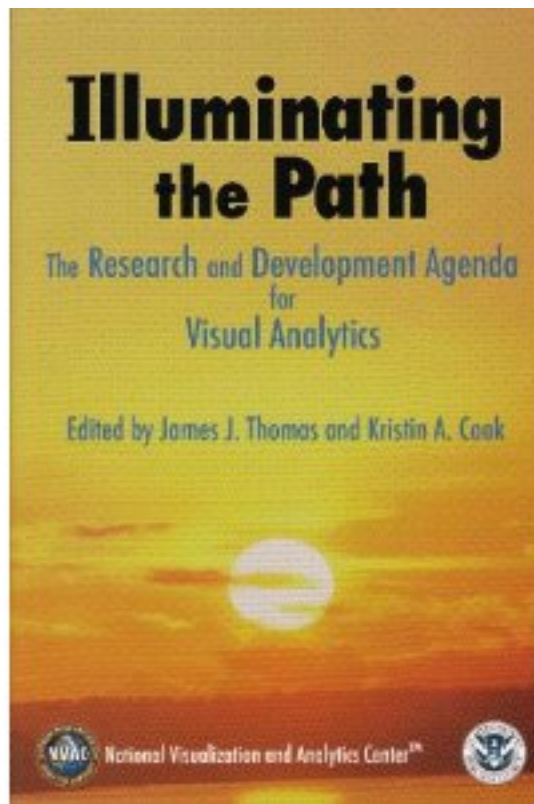
step-by-step overview

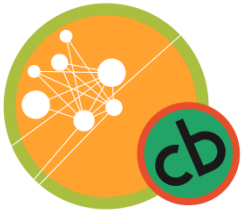
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6. Apply your approach (and tune if necessary) to the contest data and generate results.
7. Use the [forum](#) to ask the contest organizers for clarifications or to discuss the contest with other participants.
8. Your contest entry must be received no later than **Sept 1st** via email to contest@biovis.net.

contest specifics



Visual Analytics





Visual Analytics

VAST Welcome | Visweek 2011

http://visweek.org/visweek/2011/info/vast-welcome/vast-welcome

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VAST Welcome
The **IEEE Conference on Visual Analytics Science and Technology** (IEEE VAST), founded in 2006, is the first international conference dedicated to advances in Visual Analytics Science and Technology. Previously named the 'IEEE Symposium on Visual Analytics Science and Technology', in 2011 IEEE VAST will be an IEEE Conference for the first time. The scope of the conference includes both fundamental research contributions within visual analytics as well as applications of visual analytics in science, security, investigative analysis, engineering, medicine, health, media, business, and social interaction. We invite you to participate in IEEE VAST 2011 by submitting your original research, application, or evaluation paper.
For questions, please email vast@visweek.org.

Important Dates
Monday March 21st
[Paper Abstract Deadline](#)
Thursday March 31st
[Paper Deadline](#)
Thursday April 28th
[Tutorial Proposals Due](#)
Monday June 20th
[Panel Proposals Due](#)
Monday June 20th
[Art Show Submissions Due](#)
Monday June 20th
[Workshop Proposals Due](#)
Monday June 27th
[Doctoral Colloquium Deadline](#)
Monday June 27th
[Poster Deadline](#)
Wednesday June 29th
[VAST Challenge Due](#)
Friday July 15th
[Discovery Exhibition Deadline](#)
Sunday July 31st
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