

Social Visualizations @ Madmuc

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 Social Computing Class CMPT 412/898, 2009/2010

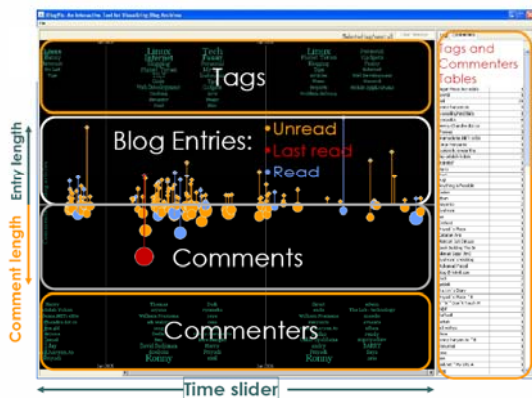


Outline

- Purpose: Finding Information
 - V of Social Interaction History for Blogs
 - V of Neighbors in Social Recommender Systems
- Purpose: Motivating Participation
 - In Resource sharing communities: V of Contribution
 - V1 Static Design
 - V2 Dynamic Design
 - V3 Final Design
 - In Discussion forums: V of Relationships



V. Social Interaction History



Indratno

Next version of Social History Vis



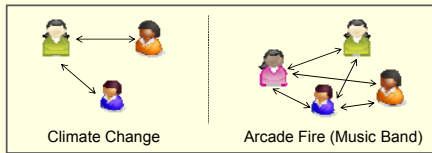
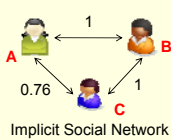
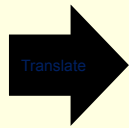
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Organizing Information: Push-Poll



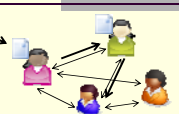
	X	Y	Z
A	1	4	3
B	1	4	
C	2	4	2

Rating Matrix



Push-Poll (in a nutshell)

- Identify subgroup
- Identify candidate items for subgroup
- Seed and push item to subgroup (based on diffusion models)
 - Poll item when active user wants a recommendation
 - Assign *activation threshold* to item for active user
 - Get *neighbours'* (adjacent users) feedback for item; adjust feedback by *influence*
 - Compare values

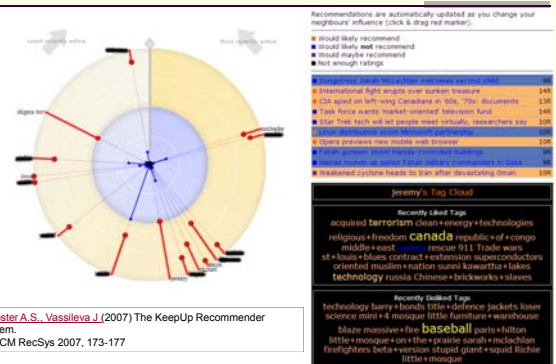


KeepUP Recommender System

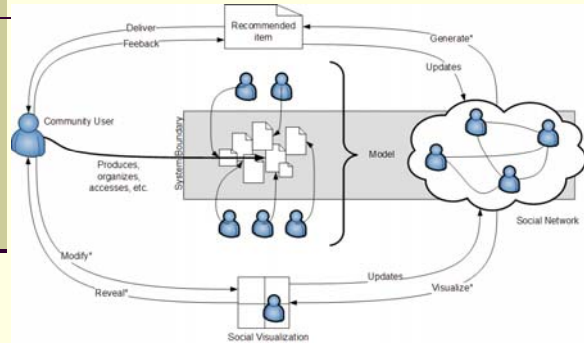
- Implementation of push-poll: recommends RSS items
- Subgroups, i.e. *channels*, are explicitly defined by users
- Channels can be defined by *tags* or keywords
 - Specific vocabularies can evolve
- A visualization shows the user her neighbours in each subgroup
 - User can manually adjust incoming influence to impact future recommendations

Webster A.S., Vassileva J. (2006) Visualizing Personal Relations in Online Communities. (2006) in Adaptive Hypermedia and Adaptive Web-Based Systems, Dublin, Ireland, June 21-23, 2006, Springer LNCS 4018, 225-233.

KeepUP: Neighbour Visualization



Interactive visualization...



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Motivating Participation

- Encourage participation in online communities
- Engage the lurkers

Method:

Social visualization is expected to activate social norms of behaviour

- encourage social comparison
- encourage reciprocity

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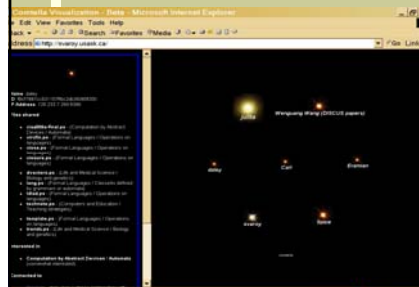
Theories in Social Psychology

- **Social Conformity – Asch**
 - People want to fit in their peer group: e.g. have similar ideas, do similar things
- **Social Comparison – Leon Festinger**
 - People tend to compare with their peer group
 - Knowing that their peers may align to them, they behave more responsibly, care about positive social image and status



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Comtella Visualization – v1



Lingling Sun

Comtella 1
P2P system for sharing academic papers in a research lab

Stars – people currently online
Size – number of contributions
Colour – “giving” or “taking” from the community
Clicking on a star shows more info about the papers shared by this peer

Brotzke H., Vassilova J. (2003) Motivating Cooperation in Peer to Peer Networks, Proceedings User Modeling UMO3, Johnstown, PA, June 22-26, Springer Verlag LNCS 2702, 2003, 218-227

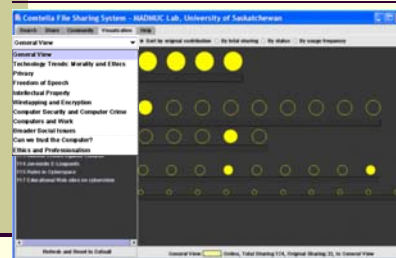
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Evaluation of v1

- Comtella for sharing research papers among profs and grad-students
- Deployed in our Department, 2 months, ~20 users, fall 2003
- User Feedback
 - Visualization is "a nice feature"
 - "Useful: easy to discover who has what...interesting"
- Major Problems of Visualization
 - Not enough interactivity
 - Shows only users that are currently online (emphasizes loneliness)
 - Hard to distinguish between sizes of stars
 - Size depends on who is active at the moment
 - No strong motivation effect, sometimes even discouraging
 - Random graphical location
 - Not self-explanatory



Visualization – v2



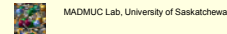
Comtella 2
Supports sharing class-related resources among students and faculty

All users shown as bubbles
Filled – currently online
4 sizes – different levels of contributions

Interactive:
User can select a view:
-View by original contributions
-View by total sharing
-View by status
-View by login frequency

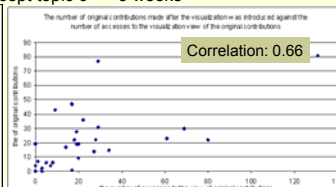
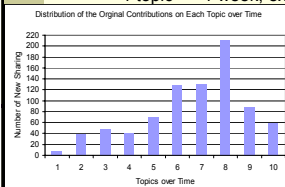
And separately for each topic

Sun, L., Vassileva, J. (2006) Social Visualization Encouraging Participation in Online Communities, In Groupware: Design, Implementation, and Use, Proceedings CRWVG2006, Springer LNCS 4154, 349-363.



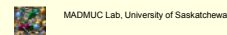
Evaluation of v2

- Subjects: 35 students CMPT 490, T2, 2003/2004
- Duration: January 11 – April 5, 2004, 10 topics, 12 weeks
 - Comtella without visualization: 6 topics
 - Comtella with visualization: 4 topics
 - 1 topic => 1 week, except topic 6 => 3 weeks



Evaluation – summary of results

- People who used the visualization more often contributed more
 - e.g. the top ten users made over 50% of their contributions *after* the visualization was introduced.
- People used more often the default view (the view showing the original contribution of each user).
 - Very few users made the effort to make an extra selection to see other views
- Some users contributed many links of low quality

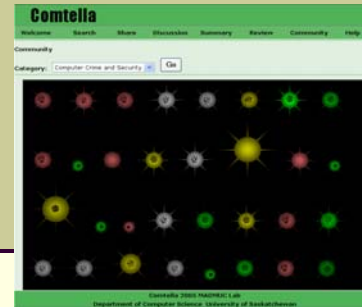


Lessons Learned

- Multi-views are not useful because users do not want to make extra selections -> need to eliminate user effort:
 - integrate as much info as possible in one view
 - user needs only to select the topic (week)
- Visualization should be intuitive and self-explanatory
- A better clustering approach needed
 - Classify users into different contribution levels based on the natural gaps in their contributions rather than on fixed thresholds
- Stars need to be more attractive
- Need to motivate social comparison in the quality of the contributions
 - find a way to visualize "user reputation"



Visualization – v3



More "real"-looking stars
Stable location of each user

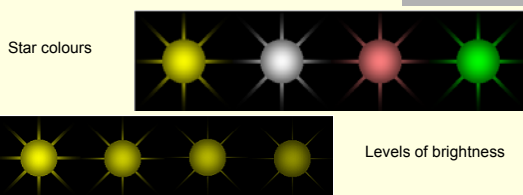
All info packed in one view
(different view for each topic / category):

- Size (3) – number of original contributions
- Colour (4) – status
- Brightness (4) – quality of original contributions
- State (2) – user offline or online

New algorithm for classification.



Visualization – v3

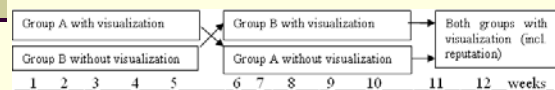


Generated using OpenGL with parameters:
- size, colour, temperature/brightness
→ More realistic and attractive design

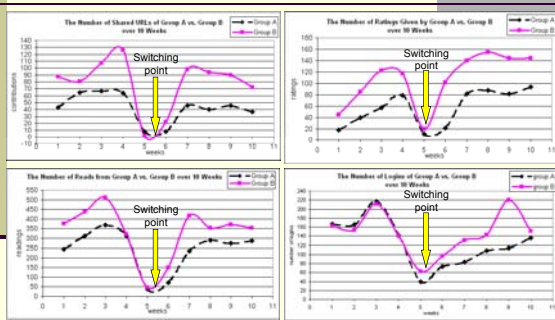


Evaluation – v3

- Comtella used as class-support tool again
- Subjects: 30 students taking CMPT 408 in T2 2004/2005, January 17 – April 8, 2005
- Experiment design:
 - two groups with randomly assigned users:
 - Group A (less active), Group B (more active)



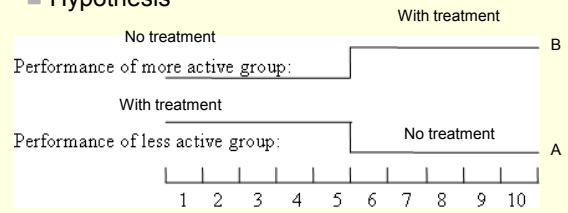
Evaluation – v3



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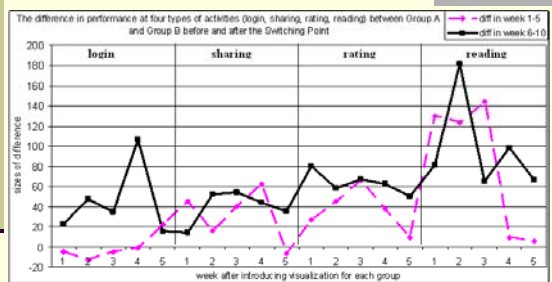
Evaluation – v3

Hypothesis



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Evaluation



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Evaluation

- The hypothesis is confirmed by the results:
 - The **inactive group becomes more active with the visualization**, (while the active group remains the same without the visualization)
 - The **difference** between the performance of the two groups **shrinks**
 - The **inactive group becomes less active without the visualization**, (while the active group becomes more active with the visualization)
 - The **difference** between the performance of the two groups **increases**
- Statistical tests (t-Distribution Test and Wilcoxon's Matched Pairs Signed Rank Test) show that the difference between the performances of the two groups is **significant** over all activities, i.e. it is not due to chance or randomness -> **it is a result of applying the visualization.**
 - Statistical significance** for **logging in** (0.95 for t-test and Wilcoxon) and **rating** activities (0.975 for t-test and 0.95 for Wilcoxon)
 - No statistical significance** for the **sharing and reading** activities.
- The visualization has a positive effect on increasing participation

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Pulling in the lurkers in Comtella-D

- Approach:
 - Visualizing interpersonal relations
 - Immediate gratification when rating



Andrew Webster

Comtella-D: combines the functionality of Comtella (sharing links) and a discussion forum

- Applied in the *Ethics and CS* class 2005/2006, 20 students

Webster A.S., Vassileva J. (2006) Visualizing Personal Relations in Online Communities. in Proceedings Adaptive Hypermedia and Adaptive Web-Based Systems, Dublin, Ireland, June 21-23, 2006, Springer LNCS 4018, 223-233.

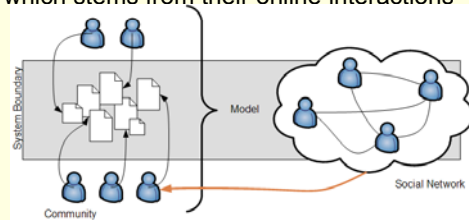


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Visualizing interpersonal relations

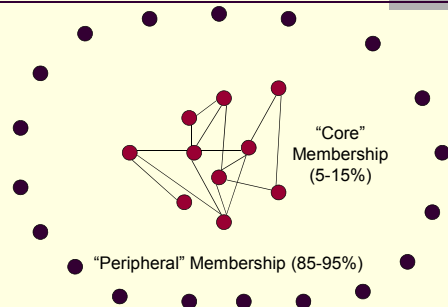
- Hypothesis: “both participation and organization can be enhanced if community users have an explicit awareness of the implicit social network which stems from their online interactions”



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Online community composition



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Approach

- Emphasize what is valued in the community
 - Rating is important – reward it (just with esthetically pleasing effect)
 - Highly rated content is valued – emphasize it visually
- Connect peripheral members to core
- Make the interpersonal relations visible
 - Who reads my postings?
 - Reciprocity?



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Immediate visual feedback on user actions of rating posts

@work Energy

The quick red fox jumped over the lazy brown dog.
By Andrew



All generalizations are false, including this one.
By Mark Twain



Stored Energy



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Topics	Description	# of Posts	Created on
Privacy	Big Brother, databases, risks, protection, awareness	14	1/4/2008
Freedom of Speech	Censorship, anonymity, laws, offensive/dangerous	0 energy units	
Intellectual Property	Fair-use, copying music/movies/software, solutions	1 energy unit	
Wikipedia and Encryption	Role of secrecy, trust in government, cryptography	2 energy units	
Computer Security and Crime	Hacking, hactivism, law, identity theft, privacy and	3 energy units - (default level)	
Computers and Work	Changing nature of work, impact on employment, emp	4 energy units	
Broader social issues	Computers and community, digital divide, bad technol	5 energy units	
Can we trust the computer?	What can go wrong, Thoreau-25 case study, reliability as	6 energy units	
Ethics and Professionalism	Professional codes and guidelines, cases, aspects of prof	7 energy units	
		8 energy units	
		9 energy units	
		10 energy units	
		11 energy units	

Community visualization – content:
Topics and individual postings that are rated higher appear "hot", those rated lower appear "cold"
→ colours ease navigation in the content
→ aesthetically pleasing, intuitive



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Approach

- Connect peripheral members to core



1. Emphasize what is valued within the community



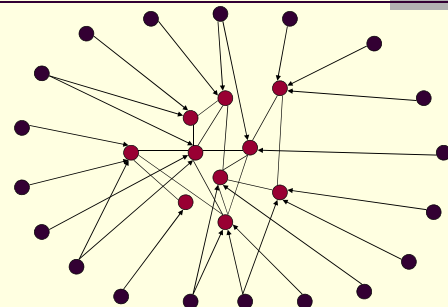
2. Make "relations" visible



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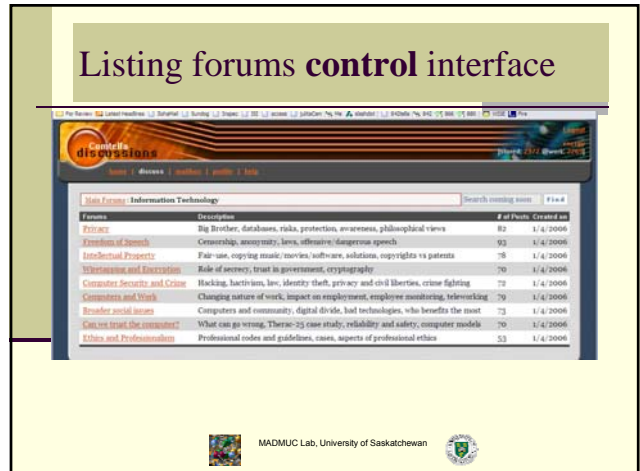
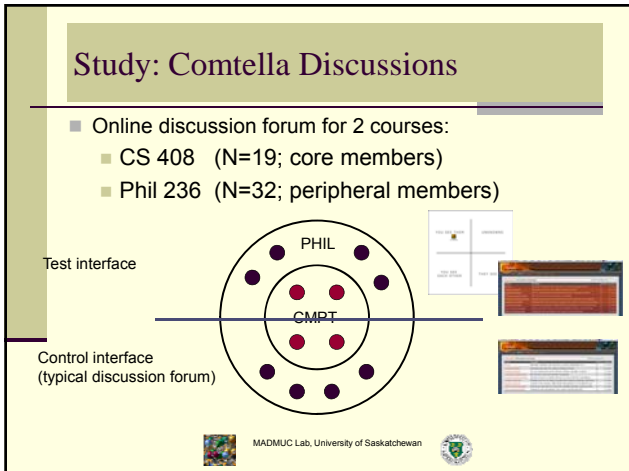
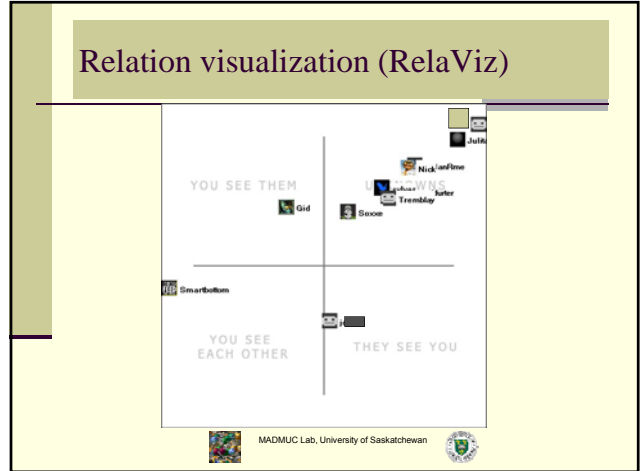
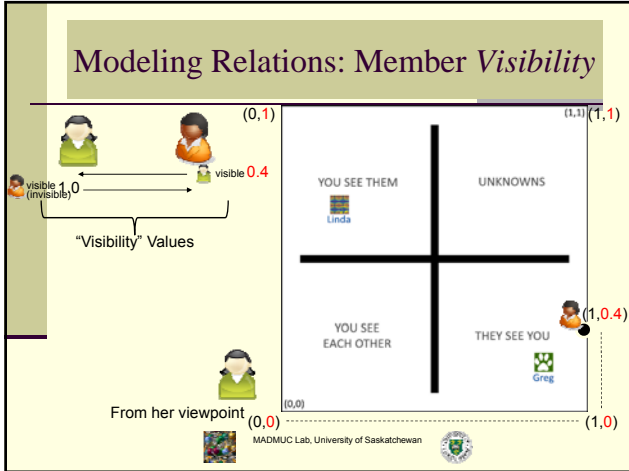


We want to "connect the dots"



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Listing forums test interface



Post header



Results

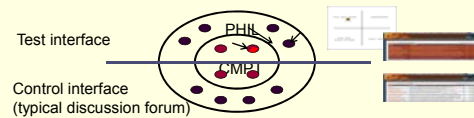
Group	Contribution Counts				Average Access / Views		
	Threads	Posts	Comments	Evaluations	Logins	Threads	Relativis
C _o	72	326	17	55	66.3	233.6	4
C _c	60	299	5	11	48.6	180.2	n/a
P _o	6	10	0	6	15.9	28.1	1.1
P _c	1	6	1	4	7.9	19.2	n/a

Grouping	Interaction (from → to)	Number of relations	Avg. Visibility
Core-to-Core	C _o → C _o	89	0.5988
	C _c → C _c	90	0.5763
	C _c → C _o	95	0.6125
	C _o → C _c	72	0.6573
Core-to-Periphery	C _o → P _o	11	0.9784
	C _c → P _o	7	0.9860
	C _c → P _c	11	0.9894
	C _o → P _c	3	0.9820
Periphery-to-Core	P _o → C _o	82	0.9624
	P _c → C _o	87	0.9674
	P _o → C _c	70	0.9711
	P _c → C _c	79	0.9742
Periphery-to-Periphery	P _o → P _o	42	0.9713
	P _c → P _c	28	0.9678
	P _o → P _c	40	0.9698
	P _c → P _o	33	0.9667

↑ high
↓ low

Discussion of results

- Counted the number of interactions between members of the groups: core (test), core (control), periphery (test), periphery (control).
 - Periphery test users interacted more often with the core group than periphery control users ($p < 0.01$)
 - Within the core group, members of the test group engaged in more symmetrical relations



Conclusions

- Community visualizations can be effective in stimulating participation
- Lessons for designing social visualizations:
 - Graphical language lessons:
 - Make the visualization attractive and intuitive
 - Don't overload with too much meaning
 - Be careful with elements that don't have meaning
 - users may attach meaning to them
 - Decide which participation actions are needed
 - social comparison should focus on them
 - Pack them in default view



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Orchestrating / conducting social behaviour?

- Online communities have a long life, priorities change dynamically.
- Dynamic social engineering is more of an art (conducting an orchestra)
- But what script / score?



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Are we doing social engineering?

- A visualization provides social awareness and triggers social norms
- But as we discussed before, this isn't always good...
 - Social pressures lead to herding behaviours information cascades (remember the failure of the MMT in the Columbia disaster, the Bay of Pigs fiasco in 1961)...
 - How do we avoid these and get only the positive sides of social phenomena?



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