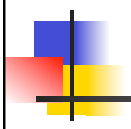
Human-Computer Interaction
IS4300



P6 – SOFTWARE PROTOTYPE DUE!

Social Computing!

- Definitions?

1. Platforms that support online communication and social interaction

2. Platforms that support collective computation

Human Communication & Social Interaction

Social Interaction

- Why care?
  - Humans are social creatures.
  - You should consider the social impact of your designs.
  - We can facilitate social interaction with tech.
- Disciplines (most of the social sciences!)
  - communication
  - sociology
  - social psychology, etc.

Communication

The fundamental building block of sociality

Notation

- Each utterance on a new line, preceded by speaker initial (Diane,Beth,Ned).

B: [1 So what are you looking for]?

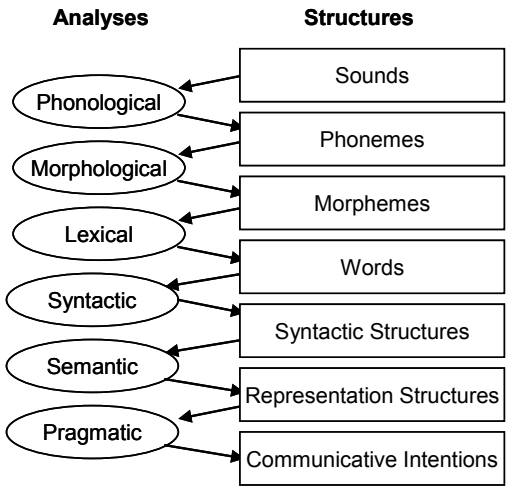
1: right hand point at B

N: Oh, um, I think three bedrooms.

Human Dialogue

Why should HCI designers/researchers study it?

Hierarchical Structure of Language

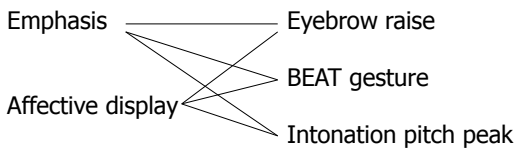


Discourse, Dialogue & NVB are all pragmatic concerns

- Intimately depend on context
- Discourse is concerned with
  - The combinatorial meaning of utterances (internal context)
  - Other contextual phenomena (external context)
    - Deixis
    - Social deixis
    - Grounding & referring
    - Etc.

Conversational behavior vs. function

- Eyebrow raise is a *conversational behavior*
- Emphasis is a *conversational function*
- There is a many-to-many mapping between behaviors and functions

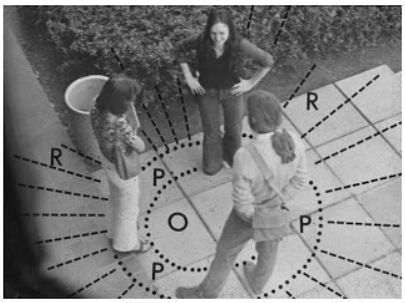


Types of Conversational Function

- Propositional
- Interactional
- Affective
- Attitudinal
- Relational
- …

Proxemics *functions?*

- Engagement & disengagement
- Social distance
- Immediacy behavior



Eye gaze *functions?*

- Attention
- Deictic
- Turn-taking

Eyebrows

- Emphasis
- Affective displays

Headnods *functions?*

- Emphasis
- Greetings
- Backchannels
- Acknowledgements

Hand gesture *functions?*

- *Form… (from David McNeil)*
  - Beat
  - Deictic
  - Iconic
  - Metaphoric
  - Emblematic
- Function
  - Emphasis
  - Propositional/Semantic
  - Turn-taking / interruption

Turn-taking

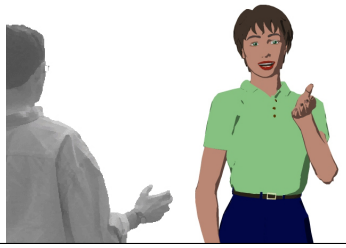
- Interlocutors cannot talk at once
- Cues for 'giving turn'
  - Gaze at next speaker
  - Pause
  - Rising end intonation
- Cues for taking 'taking turn'
  - Speaking
  - Gesturing

Grounding

- Process by which interlocutors come to a shared understanding of what is said
- A collaborative process
- Mechanisms
  - Requests for acknowledgement
  - Acknowledgements
    - Can be contingent move
  - Request for repair
  - Repair

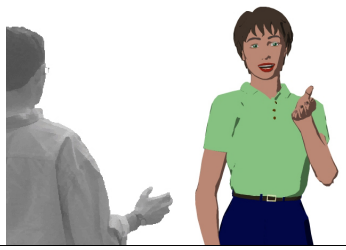
Embodied Conversational Agents

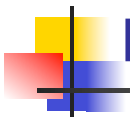
- recognize and respond to verbal and non-verbal input
- generate verbal and non-verbal output.
- use conversational functions such as turn taking, feedback, and repair mechanisms.
- can negotiate conversational process, as well as contribute new propositions to the discourse.



Motivation

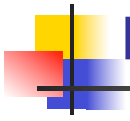
- Intuitive
- Multi-modal
- Social





Example: REA

- Acknowledgment of user's presence
  - Proxemics, facial display
- Feedback function
  - Headnod, paraverbal (e.g. "mmhmm"), eyebrows
- Turntaking function
  - User speech, gesture
  - Rea gaze
- Greeting, Farewell
- Emphasis
- Multimodal propositional output



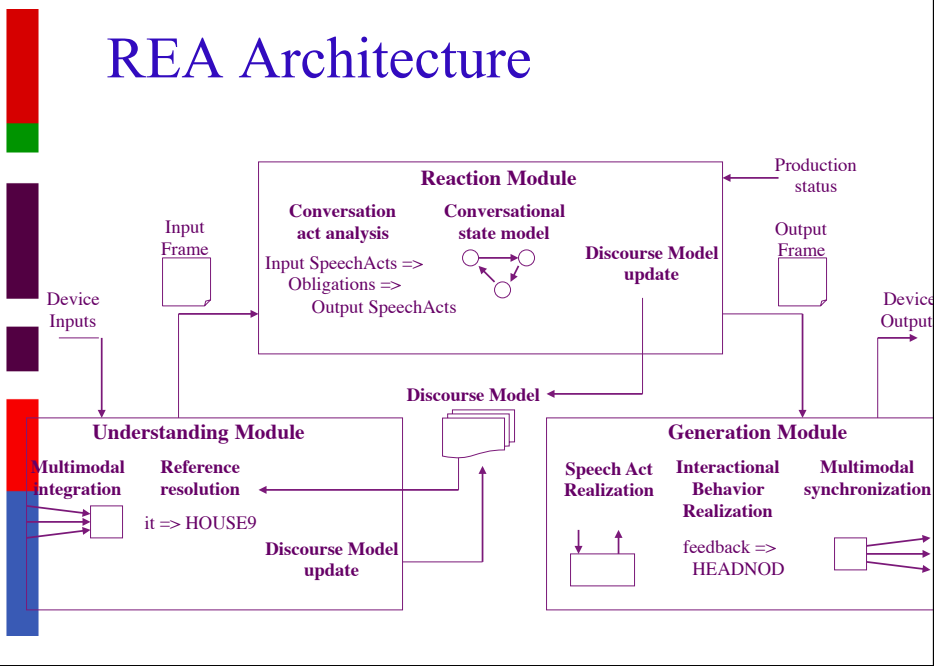
Rea Turn-Taking Model

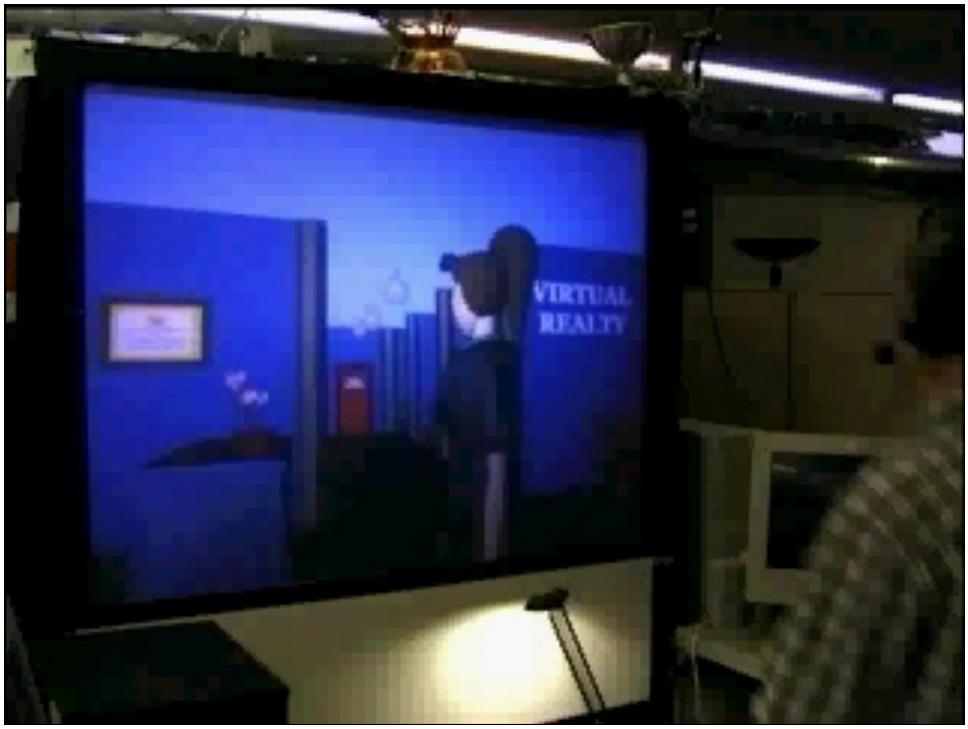
State	User Input	Input Function
Rea speaking	Gesture	Wanting turn
	Speech	Taking turn
User speaking	Pause of <500 msec.	Wanting feedback
	Imperative phrase	Giving turn
	Interrogative phrase	Giving turn
	Declarative phrase & pause >500 msec. & no gesture	Giving turn
	Declarative phrase & long gesture or pause	Holding turn

Rea Conversational Behaviors

State	Output Function	Behaviors
User Present	Open interaction	Look at user. Smile. Headtoss.
	Attend	Face user.
	End of interaction	Turn away.
	Greet	Wave, "hello"
Rea Speaking	Give turn	Relax hands. Look at user. Raise eyebrows
	Signoff	Wave. "bye"
User Speaking	Give feedback	Nod head Paraverbal
	Want turn.	Look at user. Raise hands. Paraverbal("umm").
	Take turn.	Look at user. Raise hands to begin gesturing. Speak.

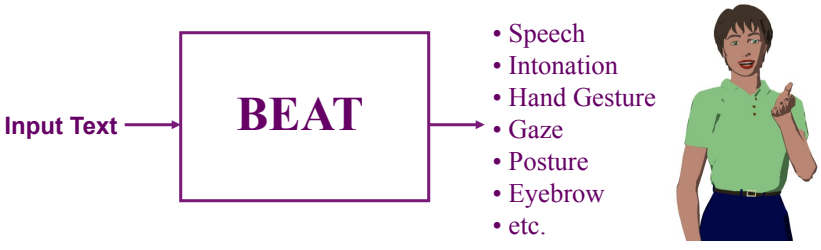
REA Architecture



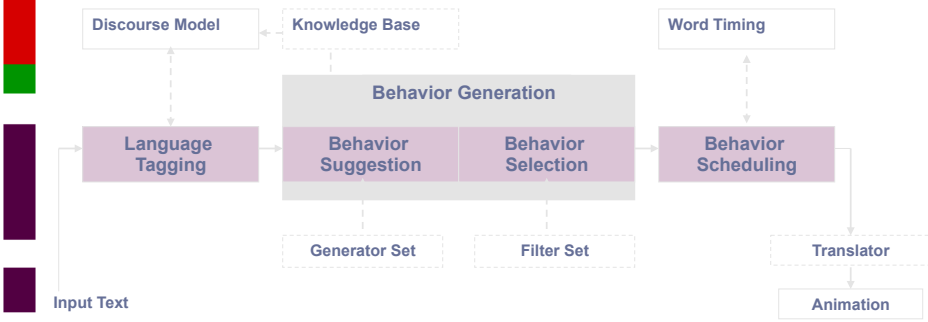


BEAT: An Extensible Toolkit for Generating Coverbal Behavior

- A toolkit to make building new ECAs easier
- Encapsulates all linguistic knowledge required to add nonverbal behavior to a script

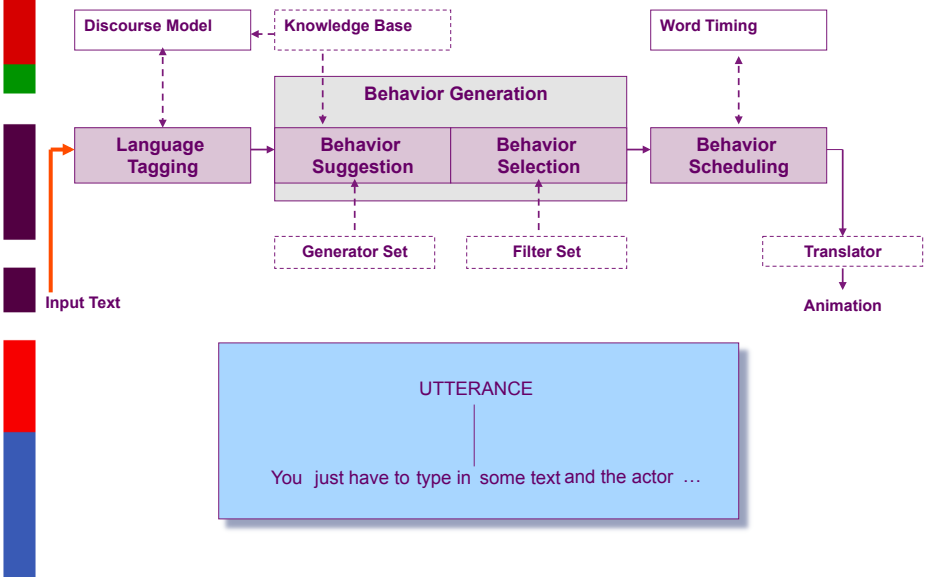


BEAT Architecture

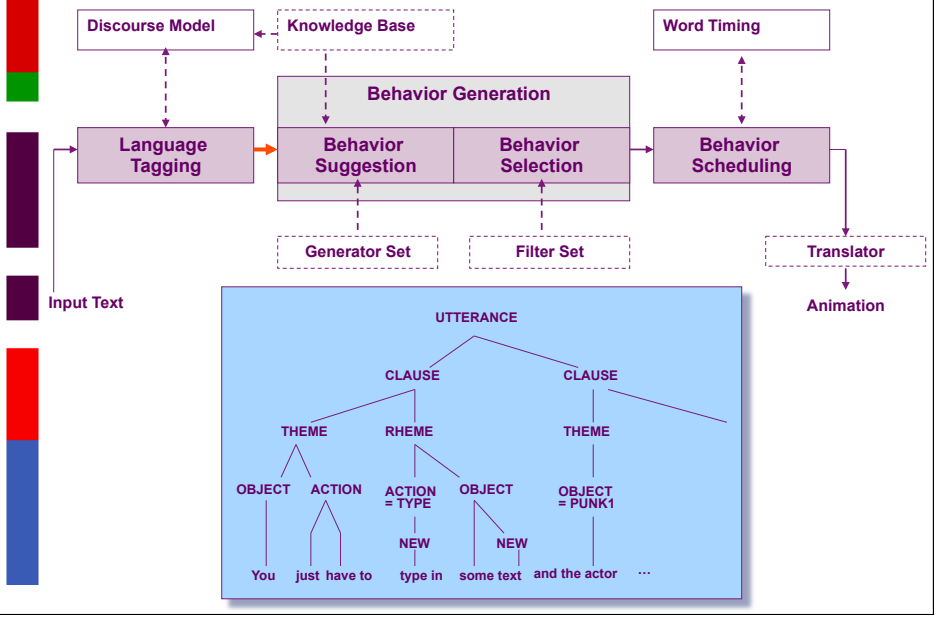


"You just type in some text, and the actor talks and gestures by itself!"

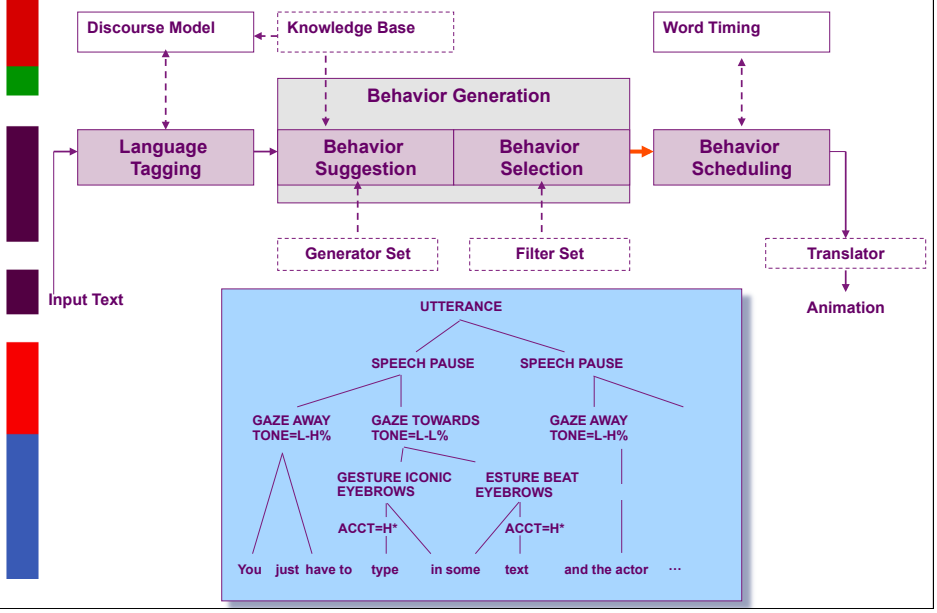
XML Trees Passed Among Modules



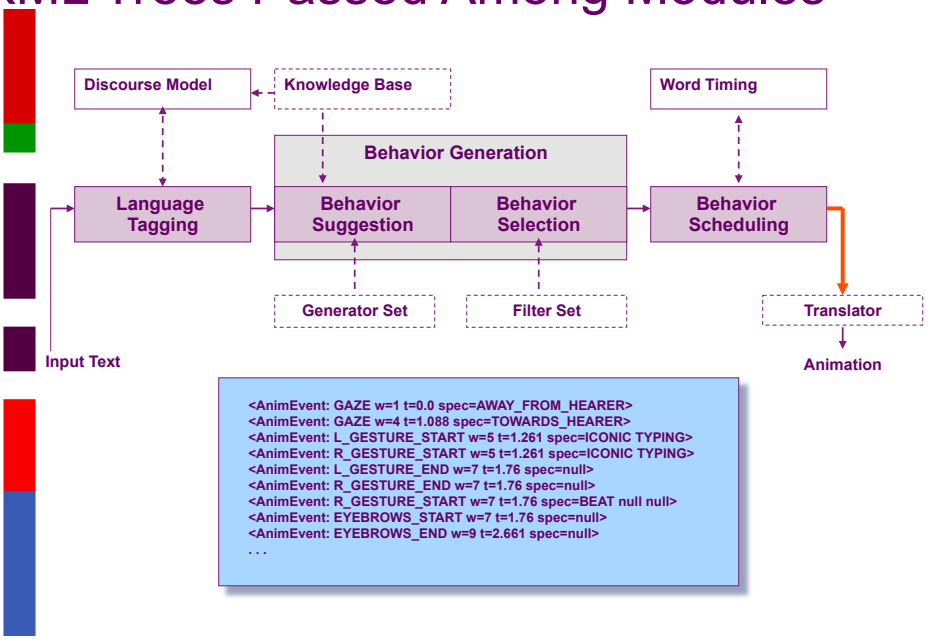
XML Trees Passed Among Modules



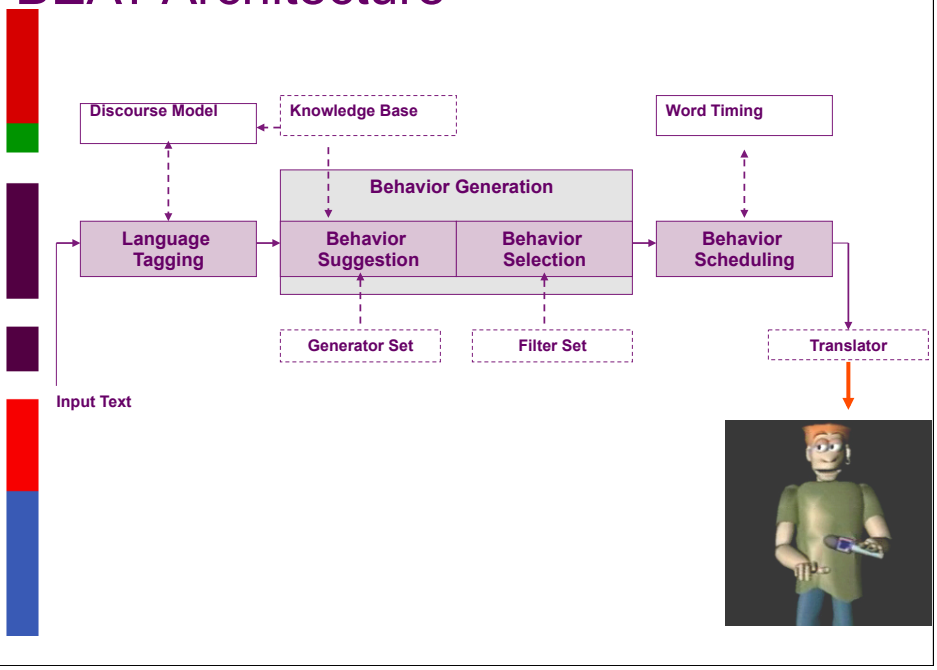
XML Trees Passed Among Modules

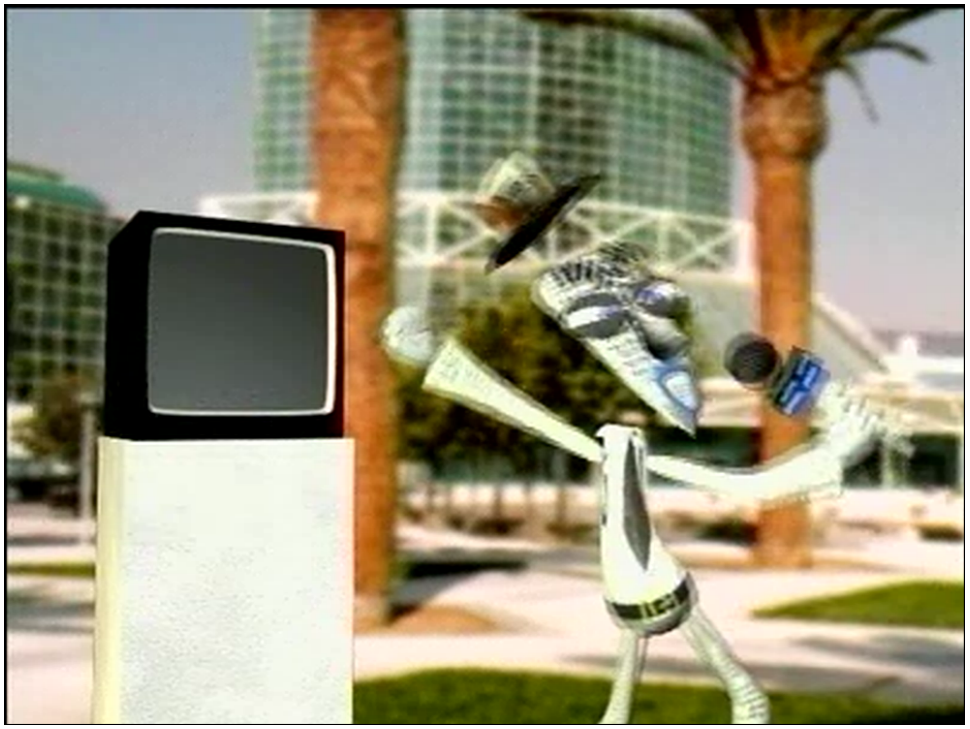


XML Trees Passed Among Modules



BEAT Architecture





What are the implications for computer-mediated communication?

Transfer effects

- carry expectations into electronic media …

  … sometimes with disastrous results

- may interpret failure as rudeness of colleague

e.g. personal space

- video may destroy mutual impression of distance

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HUMAN-COMPUTER INTERACTION
THIRD EDITION

Back channels (grounding) - media effects

Restricting media restricts back channels

video	–	loss of body language
audio	–	loss of facial expression
half duplex	–	lose most voice back-channel responses
text based	–	nothing left!

Text-based communication

Most common media for asynchronous groupware
exceptions: voice mail, answer-phones

Familiar medium, similar to paper letters
but, electronic text may act as speech substitute!

Types of electronic text:
- discrete directed messages, no structure
- linear messages added (in temporal order)
- non-linear hypertext linkages
- spatial two dimensional arrangement

In addition, linkages may exist to other artefacts

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HUMAN-COMPUTER INTERACTION
THIRD EDITION

Problems with text

No facial expression or body language
⇒ weak *back channels*

So, difficult to convey:
affective state – happy, sad, …
illocutionary force – urgent, important, …

Participants compensate:
'flaming' and smilies
;-) :-( :-)

Maintaining context

Context can be essential for disambiguation

Text loses external context, hence deixis
(but, linking to shared objects can help)

1. **Alison:** Brian's got some lovely roses
2. **Brian:** I'm afraid they're covered in greenfly
3. **Clarise:** I've seen them, they're beautiful

Both (2) and (3) respond to (1)
… but *transcript* suggests greenfly are beautiful!

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Coping strategies

People are very clever!
they create *coping strategies* when things are difficult

Coping strategies for slow communication
attempt to increase granularity:

eagerness – looking ahead in the conversation game
- **Brian:** Like a cup of tea? Milk or lemon?

multiplexing – several topics in one utterance
- **Alison:** No thanks. I love your roses.

Other concerns with designing online platforms for social interaction?

- Presence
- Relationship
- Culture
- etc

Social Interfaces – take 2

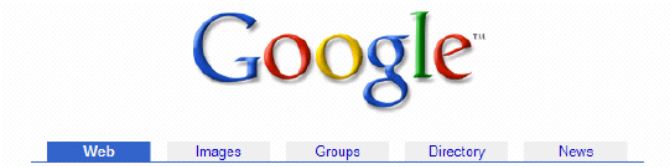
Platform for social computation

Social Computing - Erickson

- systems that support the gathering, processing and dissemination of information that is distributed across social collectives.
- the information in question is significant because it linked to people, who are in turn associated with other people.

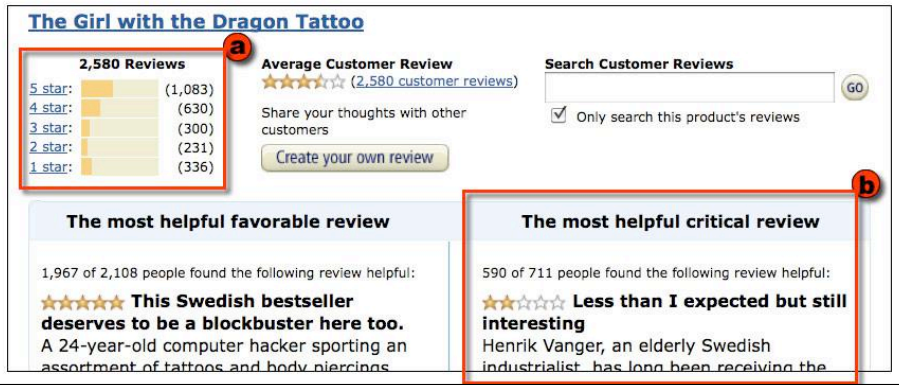
Google Pagerank

- How is this social computation?
- Mines and aggregates the results of human judgments as expressed through link creation
- One of the earliest examples social computing: digital actions of a large number of people tapped to provide a valuable service



Example: Amazon

- How does Amazon use social computing?

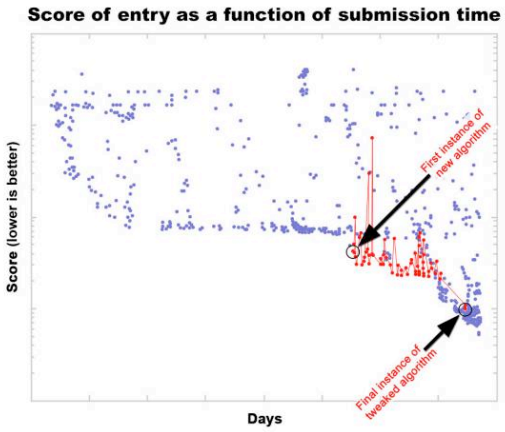


Advantages of this kind of Social Computing?

- social computing systems may be able to produce results more efficiently
  - Wikipedia offers over three and a half million articles in English
  - Can generate articles on current events overnight.
  - Within 24 hours of the 2011 Tōhoku earthquake an article was created and edited over 1,500 times

Advantages of this kind of Social Computing?

- increase quality of information



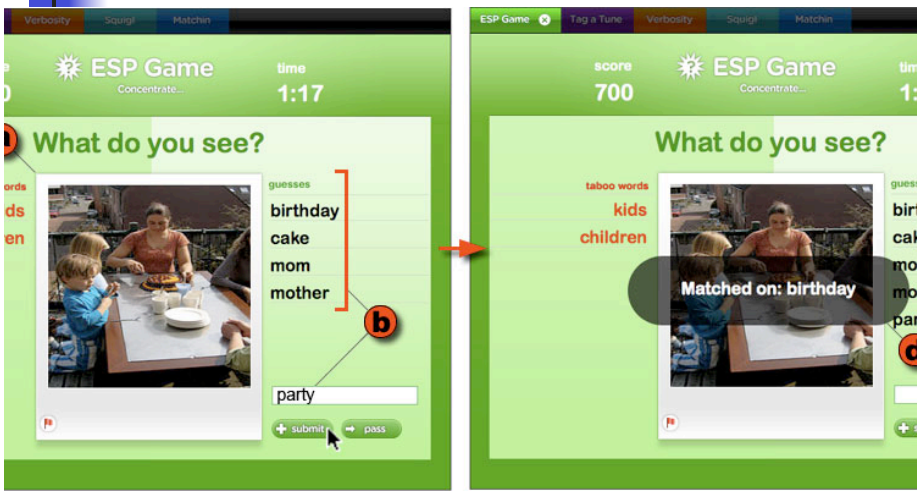
Advantages of this kind of Social Computing?

- Produce results that are seen as fairer or more legitimate
  - Amazon: trust the results of 'the crowd' of reviewers more than an 'official' reviewer

Advantages of this kind of Social Computing?

- Tapping uniquely human abilities
  - Tagging photos
  - Understanding language
  - Investigate Your MP

The ESP Game



Design Issues in Social Computing

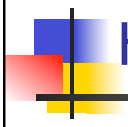
- Recruitment
- Incentives to participate
- Identity
- Quality control
  - How done in Wikipedia?

Design Considerations for Social Media

- What's different from desktop UI design?
  - Identity
  - Privacy
  - Trust
  - Credit / Reputation
  - Update propagation
  - Motivating use/contribution
  - Moderating content & behavior

Exercise

- Project Groups
- Brainstorm a (new) social media extension to your project.
- What issues do you need to address that are unique to social media?



Heuristic Evaluation & I7

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Heuristics We've Discussed

1. Feedback
2. Speak the User's Language
3. Clearly Marked Exits
4. Consistency
5. Prevent Errors
6. Minimize User Memory Load
7. Flexibility / Shortcuts
8. Simple Design
9. Good Error Messages
10. Help and Documentation
11. Use Appropriate Affordances
12. Visibility / Obviousness

CHI 2008 Proceedings · Game Zone April 5-10, 2008 · Florence, Italy

Heuristic Evaluation for Games: Usability Principles for Video Game Design

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ABSTRACT
Most video games require constant interaction, so game designers must pay careful attention to usability issues. However, there are few formal methods for evaluating the usability of game interfaces. In this paper, we introduce a new set of heuristics that can be used to carry out usability inspections of video games. The heuristics were developed to help identify usability problems in both early and

In this paper, we define game usability as *the degree to which a player is able to learn, control, and understand a game.* Our definition is based on an early informal survey of usability problems cited in critical game reviews and on playability heuristics described by Federoff [12] and Desurvire et al. [7]. Game usability does not address issues of entertainment, engagement, and storyline, which are strongly tied to both artistic issues (e.g. voice acting,

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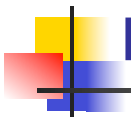
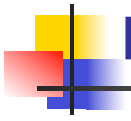


Homework I7
Heuristic Evaluation

- Each of you will evaluate two projects (each project gets 7-8 reviews).
- ASAP – check to make sure you can run the interface.
  - Contact me and the project members if any problems.
- You are to evaluate using heuristic evaluation as covered in Nielsen.
  - Answer how well the interface meets each of the criteria.
  - Write 1-2 page report on each project covering at least **12** issues (positive or negative). Clarity is important (screen shots where possible). For problems, classify them as Cosmetic, Minor, Major, or Catastrophe.
  - Post each review on a separate web page and email the relevant URL to the appropriate team members.
  - Work through the 3 tasks used in paper prototyping, unless otherwise specified



P6: Request

- On your P6 web page:
- Please identify one point of contact for your project that testers should email if they are having problems

Tester	ON	P1	P2
Al Khonaizi, Mostafa	6	1	2
Alekhine, Nicholas (Nick)	2	3	4
Aljondi, Ryan	5	6	7
Alkhairy, Maha	1	5	8
Alshammari, Farah	1	9	10
Bachiri, Zacharia	7	11	12
Baek, Kyung	2	1	3
Baquerizo, Priscilla	3	2	4
Bedell, Rodney	8	5	6
Benham, Durward	5	7	8
Bjune, Adrian	2	9	10
Camurcu, Mustafa	8	11	12
Caruso, William	11	1	2
Chao, Tiffany	1	3	4
Clark, Christopher	2	5	6
Dumoulin, Lillian (Lili)	3	7	8
Ebbs, Charles	5	9	10
Garvin, Matthew (Matt)	10	11	12
Goodman, Nathan	11	1	2
Hickman, Zachary (Zack)	12	3	4
Holahan, Sean	4	5	6
Hutchinson, Kate	1	7	8
Kelly, John (Jack)	9	10	11

Tester	ON	P1	P2
Krischer, Andrew	9	12	1
Lauture, Sanders	10	9	2
Li, Hao Lin	6	3	4
Loomis, Mallory	4	5	6
Manser, Martin	12	7	8
Matthews, Kyle	7	9	10
Ng, Michael	6	11	12
Nguyen, Stephanie	10	1	2
Oberstein, Jesse	11	3	4
Perrone, Charles	7	5	6
Riley, Matthew	10	7	8
Shah, Aekta	4	9	10
Stern, Jeremy	4	11	12
Sullivan, Ashley (Ash)	11	1	2
Sullivan, Ryan	8	3	4
Swain, Ian	9	5	6
Thompson, Nathan	5	7	8
Tong, Carisa	7	9	10
Winton, Ariel	2	11	12
Yao, Jue	7	1	2
Yu, Connor	5	3	4
Zecha, Audrey	3	5	6
Zileeva, Yulia	4	7	8

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Team	Members	Topic
1. Bosnow	Tiffany, Maha, Farah, Kate	Flashcard creator
2. Triple-T	Nick, Ariel, Chris, Kyung, Adrian	City-based activity recommender
Team 3	Lili, Audrey, Priscilla	Rebecca's Cafe app
4. DDA	Aekta, Yulia, Mallory, Sean, Jeremy	Dog Dating app
Team 5	Charles E, Connor Y, Nate T, Ryan A, Durward	Shared music app
Team 6	Mostafa Al Khonaizi, Johnny Li, Michael Ng	NEU Course Scheduler
Team 7	Zach B, Jue Yao, Carisa Tong, Kyle M, Charles P	Collaborative party music chooser
Team 8	Ryan Sullivan, Mustafa, Rodney	Fitness App
9. Team Gaben	Andrew, Jack, Ian	Steam gameplay collaborative/social app
10. Schedule Squid	Matthew G, Sanders L, Stephanie N, Matthew R	Calendar/Scheduler
Team 11	Ash, Bill, Jesse, Nathan	Banner course search re-design
Team 12	Martin, Zack H.	Social challenge

To do

- Read
  - Encyclopedia of HCI: CSCW
- Individual homework
  - I7: Due in one week!