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Aphasics’ Communities
Learning on the Web

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Agenda

- Research setting
- Aphasia, Aphasics’ communities & their difficulties in web-based learning
  - SOCRATES
    - Community (e-)learning
    - System features
    - Therapy and research assistance
- Experiences
- Conclusions & Outlook
Research setting

- Collaborative research center on “Media and cultural Communication” bringing together:
  - Historians
  - Philologists (cinema scientists, music scientists, linguists, etc.)
  - Computer scientists

- Subproject: “Impacts of networked multimedia information systems on cooperation and organization of knowledge in cultural science communities”

- **SOCRATES** is a joint cooperation together with linguists and aphasia self-help groups to optimize:
  - E-learning possibilities for remote aphasic users
  - Therapy and research assistance
What is Aphasia?
What are Aphasics?

• “Aphasia is a difficulty of language processing because of a brain injury, which is a disturbance of one or more aspects of the complex process of comprehending and formulating verbal messages.” [Damasio 81]

• Aphasics:
  - are not mentally handicapped
  - can think logically
  - are able to understand and interpret situations correctly
  - have concentration deficits
  - face spelling problems
  - word finding problems

communication via a not completely synchronous medium is of danger in breaking down
(E-)Learning processes in aphasics’ communities

- **Aphasics:**
  - Overcoming of media related deficits
  - Improving conversation skills

- **Linguists & therapists:**
  - Gaining insights in language processing
  - Development of new therapy concepts

- **System developers:**
  - Community centered software design

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**Diagram:**

- Gaining productivity from difficulties in media usage
- Conversation Communication
- User capabilities
  - Social context HHI
- Externalization
  - implicit
  - explicit
- Internalization
  - implicit
  - explicit
- Combination
- Virtual Communities
  - Socialization
    - implicit
- Personalization
  - MM-Retrieval
  - HCI
- Digital Community Media
  - Abstraction Algorithms
  - DB systems

Adopted from:
The Knowledge-Creating Company [Nonaka, Takeuchi 95]
Aphasics’ communities participating in SOCRATES

- E-learning as a “surrogate” for individual therapy due to reduced budgets
- Organized in and supported by self-help groups in:
  - Aachen
  - Cologne
  - Unterfranken
- Meeting-point for like-minded
- Offer disease related information
- Prevent people from getting isolated

⇒ E-learning as a therapy
“Protected” community meeting-point exclusively for
- Aphasics
- Therapists
- Researchers (linguists and computer scientists)

Combination of an “asynchronous” chat-board with a “synchronous” multi-user talk

Similar to Internet Relay Chat (IRC) [Oikarinen and Reed 93]

Reduced and simple user interface functionalities:
- Sans-serif fonts
- Distinct colors (per user)
- Highlighting and colored differentiation of active windows
- Basic set of icons for speeding-up the expression of moods
Technical realization

Client-server architecture

- Browser & internet access (IE 5 / Netscape 6, or higher)

- Client side:
  - Java applets

- Server side:
  - Relay server:
    - Synchronizing the chat boards
    - Storing metadata enriched conversations
  - Database server:
    - Conversation archive
    - Automated analysis and transcript generation

Client-side architecture

- Technical realization

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Multi-user talk (1)

- Community specific modification of a chat-board to foster learning of aphasics on the web
- Intended to help aphasics loosing track in a too fast ("asynchronous") chat-board conversation
- Offers up to 4 persons to start a collateral discussion
- Shows the word composition process synchronously to the other participants of this multi-user talk

⇒ Community members can help each other and adapt the conversation speed
Multi-user talk (2)

steffen: hallo 😊
lucose: hallo, steffen 😊
raff: Wie geht's dir ?
steffen: Hallo, raff, mir geht's gut
marc: Hallo, Leute ! 😊
milko: Wie geht's euch? 😊
raff: super, danke
tobias: milko, hast du Irene gesehen 😊

raff

-> hallo, steffen
-> was ist los ?
-> ein Moment, bitte...
-> anwenden

steffen

-> kann jemand mir helfen 😊
-> wie ist auf deutsch "deploy" ...

milko

-> ja, sehr schnell
-> ich habe keine Ahnung

anwenden
Data management

- XML based
- XML files contain metadata about the typing process
- Basis of all analyses
- Automatically convertible XML files for research and therapy purposes into:
  - pdf transcripts
  - rtf transcripts
Conversation analysis

- Automated evaluation of conversations
- Self-adjustable time frames

⇒ Allows to analyze and evaluate therapy results
Therapy & research transcripts

- In depth analysis of multi-user conversations
- Visualizing:
  - Corrections
  - Delays (> 1,5 sec.)
- Modification of GAT for written text pool
  [Selting 98], [Springer 04]
Conclusions

- **SOCRATES** is best suited for persons suffering from mild aphasia and severe speech apraxia

- Statement of an aphasic using **SOCRATES** frequently:
  “With chat we are all on the same level, and the thing that's important in my eyes is that we are amongst ourselves and understanding each other. [...] As person suffering speech apraxia it's good for me to be able to concentrate on writing and not pronunciation. A chatting side effect is that to keep up you have to be able to read fast. Initially, i had a lot of problems with that, but now it's more or less OK. That's why I think this kind of 'therapy' is a very good idea.” [Grefe 04]
Outlook

• Analyzing the influence of e-learning on:
  - Conversation styles
  - Themes and status of communication flow
  - Turn-taking
  - Relationship of difficulties and repairs

• Computer scientific issues:
  - Research on specific words causing trouble
  - Automated evaluation on „difficulty patterns“
  - Individual and adaptive user interfaces
  - Cross media analysis & burstiness phenomena
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www.socrates-ag.de/demo