Wisdom is not the product of schooling but the lifelong attempt to acquire it. - Albert Einstein

Human-Centered Computing (HCC) Foundations — Overview of the Course

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Introduction and Overview of Course, Aug 23, 2010
Course Structure

- lectures
- guest lectures
- demonstration of existing major prototype systems
- readings of papers
- small assignments
- independent research project by groups of students
Educational Approach

I hear...I forget.
I see...I remember.
I do...I understand.
Expectations about Involvement of Students

- active participation → presence in class
- readings and small assignments
- active learning → independent research
- collaborative learning → create a community with peer-to-peer learning supported by a wiki as course information environments
Course Information Environment

- a Wiki at: http://ngw.cs.colorado.edu/xwiki/bin/view/HCCF2010/

- all course work (lecture notes, assignments, questionnaires) will be distributed, documented, and shared via the Wiki
Course Activities

- **active and meaningful participation in class** — this will be measured primarily by the quality of the contributions, not by the quantity (obviously zero quantity does not indicate any quality), by interesting, unsolicited contributions of relevance to the class. We don’t look for facts and stats but for interest, investigation, and involvement.

- **assignments** — to encourage and motivate the students to inform themselves in order to act as active participants during class meetings, assignments will be given and the answers to these assignments will be deposited in the course information environment

- **independent research project** (including written reports and presentation in class) — students will be required to engage in independent research such as:
  - studying a set of articles or a book
  - doing empirical analysis about specific socio-technical environments supporting human-centered computing
  - contributing to sites with user-generated content
  - design or evolving some system
Grading Policy and Weight distribution

- Assignments 30%
- Involvement in Course Environment and Class 25%
- Independent Research Project 30%
- self-assessment (which will be honored “as is”) 15%
- there will be no final exam!
Homework

- answer **Initial Questionnaire**

- **due:** *Wednesday, August 25, 2010*
  in the course information environment at:
  [http://xwiki.cs.colorado.edu/bin/view/HCCF2010/Assignments](http://xwiki.cs.colorado.edu/bin/view/HCCF2010/Assignments)
Self-Application: A “New Culture” for this Course

- “symmetry of ignorance” — stakeholders are aware that while they each possess relevant knowledge, none of them has all the relevant knowledge

- teacher, learner = f{person} → teacher, learner = f{context}

- beyond exclusively teacher-driven (pure instructionist) or exclusively student-driven (pure discovery learning) education

- learning when the answer is known → learning when the answer is not known
  - the knowledge for (re)solving complex, real-world problems does not exist a priori, but is generated through collaboration among stakeholders
  - from knowledge transmission to collaborative knowledge construction
# Models of Teaching and Learning underlying the Course — Participation in a Community of Learners

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<td>transformation of participation</td>
<td>communities of learners with varying responsibilities</td>
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Passion for Learning — Beyond Tests
HCC Foundations for HCC Faculty in CS at CU Boulder

http://www.cs.colorado.edu/~palen/hcc/

- Health Informatics — Katie Siek
- Craft Technologies — Mike Eisenberg
- Cognitive Disabilities — Clayton Lewis
- Crisis Informatics — Leysia Palen
- Digital Libraries — Tamara Sumner
- Agentsheets and Agentcubes — Alexander Repenning
- Natural Language Processing and Information Retrieval — Jim Martin
- Human Language Technology Program — Martha Palmer
- Data Bases and Computer Animation — Roger King
- Software Engineering — Ken Anderson
HCC at CU Boulder

- the Department of Computer Science
  - [http://www.cs.colorado.edu/](http://www.cs.colorado.edu/)
  - exploring socio-technical systems

- the Institute of Cognitive Science
  - [http://psych-www.colorado.edu/ics/](http://psych-www.colorado.edu/ics/)
  - a community of interest bringing together psychology, computer science, linguistics, philosophy, neuroscience, .......

- the **Alliance for Technology, Learning, and Society**
  - [http://www.colorado.edu/ATLAS/](http://www.colorado.edu/ATLAS/)
  - new innovative collaborations and learning opportunities between the arts, humanities, science, and engineering and supported by new media
HCC at CU Boulder — Continued

- **Integrated Teaching and Learning Laboratory**
  
  - [http://itll.colorado.edu/ITLL/](http://itll.colorado.edu/ITLL/)
  
  - a multidisciplinary learning environment that integrates engineering theory with practice and promotes creative, team-oriented problem-solving skills

- **Discovery Learning Initiative and Center**
  
  - [http://discoverylearning.colorado.edu/](http://discoverylearning.colorado.edu/)
  
  - a collaborative, technology enhanced environment promoting horizontal and vertical integration

- **Coleman Institute for Cognitive Disabilities**
  
  
  - catalyze and integrate advances in science, engineering and technology to promote the quality of life and independent living of people with cognitive disabilities
Overview of Themes for the Course

- **8/25:** The Course Environment: Wikis (Hal and Holger)
- **8/30:** Human-Centered Computing
- Distributed Cognition
- Computational Environments
- Design and Meta-Design
- Cultures of Participation
- Social Creativity
- Lifelong Learning and New Media — Rethinking Learning and Education
- Application Domains:
  - Energy — Human-Centered Computing and Sustainability
  - 3D Modeling
  - Urban Planning and Decision Making
CLever: Cognitive Levers — Helping People Help Themselves

- supported by the Coleman Institute (2000 – present)

- focused on HCC for people with cognitive disabilities

- projects:
  - Mobility-for-All: human-centered public transportation systems of the future
  - Smart Care: supporting people to live independently
  - SketchUp and Autism: in collaboration with Google

- more information: http://l3d.cs.colorado.edu/clever/index.html
Selected CLever Projects

- **Web2gether: Online Community Environment** — supporting the members of a community (not only information management)

- **TEA: The Evaluation Assistant** — matching the needs of individuals to specific technologies

- **MAPS: Memory Aiding Prompting Systems** — creating new “knowledge” (scripts) by end-users who have no interest or technical knowledge

- **Mobility-for-All: Human Centered Public Transportation Systems** — from “anywhere, anytime, anyone” ⇒ right information, right person, right time, right way (exploiting the power of ubiquitous, wireless technologies)

- **Lifeline: Remote Monitoring** — reuse of the technological infrastructure for a different purpose
The Story Shown on the *Videotape*

- **specific**: a woman with cognitive disabilities (memory problems, no capacity for planning and remembering) and her mother

- **general**: the scenario shows socio-technical environments to help people with
  - cognitive disabilities
  - elderly people (e.g., with Alzheimer)
  - out-of-town visitors
  - foreigners
  - everyone

- **many people can not use current public transportation systems**

- **innovative technologies to “simplify” their use**
  - personal device such as personal digital assistants (PDAs),
  - mobile phones,
  - global positioning systems (GPS),
  - web-based collaboration tools