Guidance, experience, & assistance

…or at least, some topics related to ILLC research

Working group notes: ICT ILLC Workshop, October 2-3, 2008
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Key ingredients of ILLC research

- Why is this research new?
  1. Relationships
  2. Pervasiveness
  3. Informal learning in ill-defined domains
1. Relationships

- Contrast between *singular* and *multiple* companions
  - Multiple (human) companions…
    - Can share a broader range of experiences
    - Can divide up the labor of attending to you
  - Singular (human) companions
    - Can get to know you well over time
    - Can foster trust, shared experience, affective affordances
- Neal Stephenson *missed the boat* as a futurist
  - We live in a connected world, we are *never* in need of more companions
  - We publicly share private aspects of our lives with large communities
  - Twitter / Weblogs / MySpace / FaceBook is at least half the answer to ILLC
  - …missing are the benefits of singular companions
2. Pervasiveness

- **20th century learning**
  - Takes place in at a specific place at a specific time
  - Antithetical to the ILLC vision

- **Example: Hiking in the Santa Monica mountains**
  - Lots of things attract my attention
  - Me: This plant is cool…
  - My ILLC: Really? In fact that tuber was used by native Americans for…

- **Critical issue: Push & Pull**
  - If I *Pull*, then how do I frame the question / problem / context?
  - If I *Push*, the central challenge is relevance / intrusiveness / timing
3. Informal learning in ill-defined domains

- **20th century learning**
  - Learning of *subjects* in *courses*
  - ITS research could pursue a *planning*-based approach, in defined spaces

- **In the real world, problems are never given**
  - Real problems need to be framed
    - Example: In the *Numb3rs* TV show, everything is a math problem
    - “*Ill-Defined*” underscores that framing is as important as solving
  - Challenge is integrating *framing* and *solving* in lifelong learning

- **Neal Stephenson’s *bait and switch* on situated learning**
  - In the beginning, Nell learns Kung Fu to escape from an enemy
  - Later, Nell is engaged in logic puzzles and weird quests
ILLC in in the *information age*

- **Computer Hard Drive as Companion**
  - It helps me through search
  - It should guess that I know a lot about Photoshop
  - It could guess who I should go to for PowerPoint problems
  - It is my e-portfolio
  - It lots of *pull, little push*

- **FaceBook as Companion**
  - My companion is my social network
  - My social network distribute the work of paying attention to me
  - I keep my social network aware of what I’m doing
  - The relationships with my companions transcend technology
Toward the *diamond age* of ILLC

- **Intelligent Lifelong Learning *Travel* Companion (ILLTC)**
  - Relationships: People often travel together, go to the same places
  - Pervasiveness: Travel is inherently situated
  - Informal / Ill-defined: Travel transcends subject boundaries, or course definition

- **Mashup approach**
  - Put a singular persona on my social network
  - Let the Hard Drives of my Facebook community all talk with each other

- **Great funding argument**
  - Researchers all love to travel and know the domain very well
  - The military also likes to travel
Notes

Why are we here?
Bootstrap a new research program?
Get new funding?
Relevant conferences / areas / journals / labs / people?
ITS
Interactive narrative?
ICWSM? Social media?
Ed-Media
Cognitive Science -> Learning sciences

Why AI?
ITS has an unbalanced focus on planning over situated action
Winograd / Suchman view of planning and situated action
People who are truly knowledgeable can answer the 21st question, when 20 are given
How does a ILLC assist when some domain knowledge is already known
Distinction between planning and situated action
Example: SAP enterprise software
Supports work processes, assumes people work according to work practices
Real work is defined by dealing with exceptions
Need to rethink the contribution of planning, when situated action is needed

What is new here?
This not just an excuse to do more basic AI research...
The real difference is that this is going to be lifelong
The non-negotiable thing about this research program is that it is going to be lifelong
Automated (lifelong) curriculum planner?
Minimal thing you could call a "lifelong learning companion"
Has to have a model of the learner
What you have done already
Should handle the (blue) non-formal learning as well as (yellow) formal learning
A 4 year period is pretty good – an exciting challenge

1. Relationships
   Relationships take time to develop
   Companion (sing) handles the learner model
   Relationship work ends up being central here
   Tim’s work
   Cory Kidd – Intuitive Autonomy
   Graesser’s group at Memphis, effect of emotion on learning
   All of Jon Gratch’s collaborators
   Scott McQuaig
   Also emotion / relationship among humans
   Theories of “Flow”
   Frameworks are needed, can be tested in HCI
   Working Alliance, dependent measure?

2. Pervasive
   Key difference between ITS now and Diamond Age Primer
   Bait and switch in Neal Stephenson’s book
   Teach kung fu in order to get away from mean dude
   Later, weird quests are abstracted from real world context
   Shift away from focus on Subjects
   Algebra, Physics
   Well organized bodies of knowledge
   Is there an Informal physics instruction?
   How to build intertwining elements between framing and solving?
   Ex. Numb3rz TV show, framing everything as a math problem

3. Ill-defined domains
   In the real world, problems are never given
   Need to be framed
   Unstructured is another word
   "ill defined" underscores that the framing is as important as the solving
   Closest existing examples of ILLC
   Your hard disk is your best companion
   Search is the way it helps me
   It should guess that one knows a lot about Photoshop
   It could guess who you should go to for Photoshop problems
   It is your e-portfolio
   MyLifeBits – Started investigating storage, focus is really on what you know
   Social Network systems – Facebook / Twitter
   Ex. John Seeley Brown on watercooler talk
   Stephenson misses the boat – technology is intrusiveness / timing
   Communication
   The term “companion” implies you are alone.
   This century, you are never alone – you already have dozens of companions
   User modeling
   Singular companion
   Gets to know you over time

Multiple companions
   Provides access to
   If at it knows is me, that is not very useful
   Social Psychology
   Transactive memory
   If I know who to ask, it is as good as knowing
   Does it help if you get it from your companion, rather than a human source?
   Distributed intelligence / Cybernetics / network companions, etc...

Good domain for ILLC: Travel
Researchers like to travel
Wisdom of crowds
Pervasive
Dynamic / Open / Always changing
Military does it too…
Sounds like situation awareness, cultural awareness
Bad things happen to tourists as well…

1. What to deliver
   The learning companion also needs to learn How?
   From your experience?
   From the experience of others?
   What to deliver depends on what it knows about you

2. When to intervene
   Push / Pull
   If I push, I need to frame a query / problem / know what is available
   If I push, the central challenge is relevance / intrusiveness / timing
   Circa 1998 : You’ve got mail!
   Now, miniscule icon change
   Perhaps related critically to What is given
   Utility analysis of delivering the delay of information
   Eric Horvitz at Microsoft Research has done some nice utility analysis