University of Colorado at Boulder

Gerhard Fischer

Campus Box 430
Boulder, Colorado 80309-0430
(303) 492-1502
fax: (303) 492-2844
email: gerhard@cs.colorado.edu

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To: Claudia and Bill Coleman, Coleman Foundation

From: the Members of the Coleman Intelligence Augmentation Project (CIAP)

The Coleman Intelligence Augmentation Project: "Helping People Help Themselves"

—

Innovative Socio-Technical Environments to Empower Humans (specifically mentally disabled humans) with New Cognitive Artifacts

Phase-1: January – June 2000

Website

1. Project website at:
   http://www.cs.colorado.edu/~l3d/systems/ciap/
   (this is a very initial attempt!

2. Development of **a logo** for the project (current use of the CIAP ellipse); question to Bill: does BEA employ graphical artist for website development?

issues for further development:

1. should the website serve the people working on the project (Intranet for CIAP research community)?
2. should the website serve all the participating communities (experience journal type systems for parents and teachers; Envisionment and Discovery Collaboratory-type systems for disabled people)
3. question: can we generate different websites from the same underlying concept space? (question: how does BEA manage their webspaces)?

mission statement (this is for the Coleman Intelligence Augmentation Project, not for the Coleman Institute)

The mission of CIAP is to provide computationally enhanced environments to assist people with a wide range of cognitive disabilities. Our research group at CU has been focused for the last 15 years on Intelligence Augmentation (IA) approaches with the objective of complementing, empowering and augmenting human capabilities.
We believe that individuals can (and in some cases must) follow very different learning paths. Our goal is to respond to that challenge by creating environments that match individual needs and learning styles. It is our hope that all people (ranging from severely mentally to mildly disabled to slow, normal, and gifted learners) will greatly profit from the conceptual frameworks and systems which we will develop.

Claudia and Bill: We would very much appreciate if you could take a brief look and let us know in case you have any feedback, suggestions for improvement, etc.!

Initial Life Stories

issues to be discussed/addressed: *privacy requirements*, needs, and desires of our "life story" participants

Down Syndrome

Claudia and Bill: can we get some input from you?

quote from Claudia: "our niece can deal with computers (she is operationally competent), but she does not comprehend the information".

general remarks based on initial interactions:

1. IQ 50-70 (can be employed with supervision)
   1.1. will not be able to drive a car

1.2. maybe be able to ride the bus by themselves (with a voice activated computer)
2. easy to diagnose
3. one major problem: can (sometimes) read (sounding out words) ←→ but have difficulties in "comprehension" (→ Walter's research, LSA support??)
4. why do they comprehend spoken language better? → because social language is much simpler → potential research question: can we translate written language into simpler forms?
5. technologies:
   5.1. voice activation for computers → could tell them their shopping list
   5.2. going shopping by themselves: match words and items
   5.3. require a lot of drill and reminders to cope with their daily chores
   5.4. helping to break tasks down into simple steps
6. jobs for people with Down Syndrome — specific examples:
   6.1. CU/UMC: wiping tables
   6.2. bagging groceries in supermarkets
   6.3. distributing towels in hotels
7. like to be independent and earn money
8. information about Down Syndrome
   8.1. clinical information: see CIAP website: http://www.cs.colorado.edu/~l3d/systems/ciap/clinical_information/down_syndrome.html
   8.2. for yahoo club: see http://dir.clubs.yahoo.com/Health___Wellness/Support/Illnesses/Down_Syndrome
9. further contact (see CIAP website): Robert Brayden, MD, The Children's Hospital, Denver. Dr. Brayden is the developer of the Denver Child Health Passport for Children with Down Syndrome which can be ordered by calling the Mile High Down Syndrome Association at (303) 797-1699.

Autism

general remarks based on initial interactions:

1. belongs to *PDD (=pervasive developmental disorder)*
2. often very difficult to diagnose
3. parents think that their child can be cured → and in most cases, can not be
4. there are two categories of autistic persons:
   4.1. *Kanner-type:* majority of them are retarded, often severely
   4.2. *Asperger-type:* are often of normal (and sometimes very superior) intelligence with particular originality of thought and experience → examples: Temple Grandin, character played by Dustin Hoffman in "Rainman")

Initial Life Story: Temple Grandin, CSU, Fort Collins

professor of animal science, business owner
see: Oliver Sacks: "An Anthropologist on Mars — Seven Paradoxical Tales"

Initial Life Story: Andrea

Andrea's disability is undiagnosed at this time, but it appears to easily fall within the autistic spectrum (mild side).
Andrea is 7 and in the first grade. She sees a speech therapist, physical therapist, has a half-time aide and a "special" educational tutor and advisor to the school (the last two the family provide.

this year, for the first time, the insurance company decided they could cover the majority of the cost of the s & p therapists).

Andrea for the past two years has gone to Sage Elementary (a private school over on Penn Ave in Boulder). The parents had her go there because it was painfully clear to them that at this time the public school system in Boulder would be unable to be of any real value to her (they used their therapy services for speech and OT for one year but had no impact on her).

question: the public school system in Boulder would be unable to be of any real value to her --> WHY?

They wanted to put her a in resource room with 4 other kids 20 hours a week. 3 of the 4 were what would be considered EXTREMELY developmentally delayed, 2 couldn't even communicate really. Plus, they wanted to have her have her speech and occupational therapy with other kids, instead of alone.

We have had her in "group" therapies before and it just doesn't work with her. She needs to have very focused activities. The mother of the child is very well connected in the various networks for PPD-NOS. She believes that the family is off the Boulder School Boards horizon. They know two families that left Boulder (and Colorado) because the services for developmentally delayed kids are so bad.

Cerebral Palsy

Initial Life Story: Cathy

(questions by Gerhard; answers by the mother of the child with cerebral palsy)
question: which technologies you have used over the years to help Cathy? what was successful? what was not so successful?

Over the years we've used:

3. Switch access for word processing, using Morse code. Cathy accessed the switch with her head. She was successful at accessing the switch, but it was not an efficient method. It was unsuccessful. · Power wheelchair mobility. Three different attempts: 1-joystick accessed by the hand. Not successful. 2-headswitching- too jerky, not successful. 3-joystcik access by the head. Cathy was successful at accessing and running the chair, but her body response was so intense (muscles became stiff and hard), that it became impossible for her to continue. · Voice activated computer access. Cathy tried this for 2 years using Kurzweil software. Her voice was not consistent enough, and this ended up unsuccessful.
4. Cathy tried the communication device call the "Liberator" by Prentke Romich.
5. She memorized all 128 icons and their positions, and even understood the abstract method of "minspeak" which the device employs, but she was unsuccessful at scanning and putting together sentences due to the very tedious method of the device, and her body response. She also tried to use the device to control environmental technology, but it was not sophisticated enough, and broke down often.
6. Cathy is currently trying a communication device called a "Dynavox". I have just begun training on this device to help her customize the one she is using.

q: how did you learn about these technologies?
Usually through speech therapists or special education teachers.

q: how easy was it for you to learn about these technologies and to exploit their power?
Not easy at all due to 1) time constraints and 2) lack of availability of individuals proficient in the device to teach us.

q: did the schools which Cathy attended have adequate/helpful technologies?
They tried. It is a very poor and inefficient model, however. I think in order for Cathy to excel, she would need to go to a school that specializes in technology, where all the educators are versed in the different technologies.

q: did the teacher in the schools exploit these technologies to Cathy's advantage?
No

q: what was you experience with the BVSD? was it better or worse compared in Washington? How could schools and teacher change to be more supportive of Cathy?
It's a "toss up". The people working with Cathy in BVSD were very willing to help Cathy and to learn what was necessary to help her progress. One problem, however, is integrating the time that technology takes, into a regular academic day. No one seems to know how to fit it all in.
Out here in Virginia, the school district has a specialized group that works with the whole school district. It is call "Integrated Technology Systems". They seem fairly knowledgeable, and have tried several different things with Cathy. The problem is that by the time they pass it on to someone to work with in Cathy's school, those individuals are much less proficient in the technology, and so much of the time is spent in "trouble-shooting" devices and software. The people with the real know-how, are at the top, and don't work one to one with the students. This is where so much of the technologies "fall down".
Desirable changes would be that there are trained personnel who can really work one to one with students, and help the systems progress at a much more rapid rate. Perhaps there could be schools in each district that specialize in technology, particularly for students with complex needs. This school however should be integrated with non-handicapped peers. I've always thought it would be interesting to have a school where the "talented and gifted" students actually helped solve some of the technology issues with the more challenged students. There could also be "internships" there for graduate students specializing in these fields. It would also be beneficial that every single teacher take courses in special education issues and technology, as the ideal paradigm for the inclusion process is that all educators have part in the overall education of students with special needs.

q: which media of the information age can Cathy take advantage of (e.g., is she able to use the WWW?) if yes: what is she using it for? if no: why not? --> no use for it? difficulties to access it?
Cathy would LOVE to be able to access the computer and type and receive Email. As of yet, we have not found a way for her to do this independently. Also, of course, she'd like to drive a power chair, and access environmental controls for television, telephone, stereo, etc.

q: are there any technologies which help Cathy not only to access information (e.g., by watching TV shows), but which help her to express herself and act as an active contributor to something?
The communication device that I described - the Dynavox_ is a portable type computer that can speak for her, do word processing, and access the infrared (remote-controlled) devices. It is quite amazing, flexible, and complex. We have the multi-task of helping Cathy to learn to access it by switch scanning, and of me trying to learn all it's complexities to program it for her. Ideally,

someone in the district should be doing the customizing and programming for her, but as I mentioned, this type of one to one assistance is not available.

q: Can you envision future technologies which may prove really useful to Cathy? what would you like to see developed?
Sure. I dream of all sorts of things, like a device that reads her mind and outputs for her. I dream of technology that will one day help her muscles, such as electronic implants. The sky is the limit with my dreams. Reality, however, imposes more practical limits.

Q: are you involved in networks of people (physically and virtually) with other people who are in the same situation as you are? if no: why not?
I used to be more so in Boulder. Out here, the area is so large and complex that it is more difficult to network with others. The other thing is that individuals with brain damage are so unique, that what works for one, often does not work for another. Usually devices and systems must be highly individualized and customized.

Q: are you involved in networks of people (physically and virtually) with other people who are in the same situation as you are? if yes: what do you get from these networks? help for you? advice for Cathy? sharing of life stories?
Often, I have. But very truthfully, it often makes life more frustrating for me. It seems that almost everyone can find SOME way to access things, but Cathy never can. Sometimes, I actually don't want to hear their stories. Other times, I can glean ideas from them.

q: do you feel that the medical community is truly knowledge about Cathy's situation? (or do you know now more having lived with Cathy for 20 years than they know?)
I feel that I definitely know more of Cathy's overall picture than they do. I feel that the weakest link in the medical field is that they really don't look at individuals like Cathy with a "holistic" approach. They see only their area of expertise, and forget to look at the overall picture. For instance, the new device that Cathy is using is very exciting to her. However, when she attends to something or "tries" really hard to do something, her body becomes very stiff, causing pain and fatigue. This then affects her performance on her device. We are now seeing her motivation level drop, as her pain level increases. Also, very often the specialists "fall in love" with the device or the technology, it's possibilities, its potential (in a perfect world), and forgets to look at the questions of how realistic or practical is it to really incorporate into one's life. Is it expensive ($9,000 - yes)? Is it unwieldy? Will those around her in various places be able to help her use it and incorporate it into her day? Is it dependable, does it breakdown often? Is it efficient or in other words -- will others really be patient enough to give her the necessary time to use it? The other thing is that the professionals get excited about evaluating and prescribing a device, and then do very little to help the progress of the family with it (the "follow-through").
Believe me, any parent of a child with special needs can describe to you the assortment of devices somewhere in their house collecting dust and spider webs, because no one asked the hard questions of practicality, and no one assisted in the "follow through to progress" process.

Q: do you have interesting video material that shows how Cathy copes with her life (and which you might be willing to share with us)?
I'm not sure exactly what area of her life you're talking about. Since most of her attempts at technology have been unsuccessful, we do not have documentation of them.

Blind and Deaf: Dorothea

an email from Dorothea as an initial response on whether she would be interested in working with us:

Your inquiry is quite timely. I've been doing some research on my own about new aids, or actually developing new aids, through our IR&D and BBI, perhaps in conjunction with some researchers at CU.

I'd be happy to speak to your friend, Gerhard Fischer. He might already know something which I am tracking right now. Dave Begley and Alan Mord have shown some interest in assisting, and I once spoke with Dr. Victor Bright from the department of mechanical engineering. Dr. Bright was presenting on microelectromechanisms (MEMs), which have applications to aids like my Optacon.

In addition, I am retraining right now on a PC with Windows NT. I ran a Mac and its software for six years prior to that. Perhaps Gerhard and his researchers would be interested in how we do the retraining.

Tourette Syndrome, obsessive-compulsive disorder, and attention deficit disorder

Information and resources on families, educators, and treating professionals, including classroom tips for teachers.
at: http://www.tourettesyndrome.net/

Life Story: from Allan Collins

Boulder Valley School District

Meeting with Representative from the Boulder Valley School District, February 22, 2000 in L3D Lab

Attendees from the Boulder Valley School District's (BVSD) Assistive Technology Team (ATT):

1. Rosemary Bogart, M.S., O.T.R.- Rosemary has been an occupational therapist in the BVSD for 4 years. She has recently completed her Master's degree in O.T., with an emphasis on the use of assistive technology. She has also worked at the of Colorado State University Assistive Technology Resource Center. She is currently the team leader of BVSD's Assistive Technology Team.
2. Anja Kintsch, M.Ed. - Anja has been teaching for seven years in both resource and multi-intensive special education programs. She has worked with both high school and elementary school students. She received a Master's degree in Special Education at Vanderbilt University with an emphasis on assistive technology.
3. Dr. Georgia Magnera - Georgia has been a speech language therapist for 15 years and part of this BVSD for five years. She received her doctorate from the University of Alberta in Canada in the area of psycholinguistics. Georgia has been a part of the Assistive Technology Team for five years and is a former team leader.

Meeting Summary:

1. BVSD has an integrated program, which means that the special ed. students are commingled with the other students. They also have additional classes to help students learn to work with assistive technologies in their regular classes.
2. The devices that students use need to be programmed with lesson materials for their regular classes. The special ed. teachers can't anticipate the lesson plans ahead of time and therefore the ramp up time is too long. → Q: Can a national repository of lesson plans be developed so that teachers using compatible devices can share lesson content?
3. The technology is difficult to work with. They can't standardize the use of devices because kids or families may not like one device or another. Students have personal learning styles so there are no cookie-cutter solutions. Solutions need to be tailored to the individual. → Q: Can this be related to the "Personalization" effort that is taking place in BEA's Boulder office.

A follow-up meeting is planned for April 6th, 2000, where we will visit the a school to see and understand some of the devices which are used to assist special-needs students become integrated into regular classrooms.

Meeting with Representative from the Boulder Valley School District, April 6, 2000 at their School

hands-on demos of the equipment they use

- they mentioned the issue again of needing to rapidly develop lesson content for their devices and/or software programs.
- our suggestion: developing a repository where they could save their work for later reuse. This excited them.
- we got an appreciation of how busy they are. I asked if they would take the time to place their work in a repository when they are already faced with another task of developing content for another student. This was a sobering thought for them. They did not think they would have the discipline to do this.
- idea of developing software to support their process of collecting and programming content. I like this approach. By doing this we may be able to accomplish two things: 1) make it easier for them to develop content and 2) capture their work product in the process, therefore eliminating the need for them to do extra work to save and catalogue their work. I think this is a promising line to pursue.
- difficulty they have in trying out new technology. There is a lending library (I think at the state level), but it takes six months for them to get a piece of equipment and then they only have it for two weeks. This makes the program of little use to them. By the time they get the equipment they are either no longer interested or do not have the time to spend figuring out how it works. They are interested in a long term relationship with us. I thought that if Coleman establishes a new foundation for research on campus, BVSD would be a good test bed for new technology. If they had greater access to new devices they would be able to more effectively evaluate and integrate them into their program. Furthermore, technology needs to be simple to use. Equipment that is too complicated will often not be adopted -- no mater how much potential there is. Because of their busy schedules and lack of resources, the threshold for adoption of new technology needs to be very low -- walk-up and use.
- possibility of supplying them with a tech-savvy undergraduate. They were excited about this possibility. If we ask Jessica if she would get involved with this I think that she and an undergraduate would be useful in better understanding the teachers' day-to-day activities,

while at the same time providing them with some day-to-day technical support. They mentioned that they have someone from the university already working with them, I need to email Anja and get more details about this -- there may be a way to combined forces -- or at least understand what other work is being done at the university.
- desire for them to develop closer relationships with all of the special ed. teachers in the district so that they could share their expertise and work. This brought to mind the work that was done with New Vista and working shops. I wondered if there was some way to apply that work to this situation.

discussion of two future meetings:
1. one where we will observe students using the technology we have seen day;
2. another where we will observe the special education teachers as they get a request for new material from the students regular teachers and subsequently develop some lesson material for the student. This second activity would help us understand how we might eventually support this process.

Understanding the Landscape and Building Communities

Gerhard Fischer: extend the build community building effort

1. Colorado Assistive Technology Project (CATP)
2. school districts:
   2.1. Rosemary Bogart, Anja Kintsch, Dr. Georgia Magnera (see report above)
   2.2. Fay Byrd: speech therapist with Adams county school district
   2.3. Janet Eblovi, special education teacher, Boulder
   2.4. Brenda Garnett: school psychologist with BVSD (has worked with 35-40 students with down syndrome and about 40 with autism in the BVSD)
   2.5. Scott Schwartz: BVSD autism specialist, district wide

Gina Cherry (summer)

will do significant literature review and information gathering, as well as supervising ETH student work. Gina is completing her PhD work on technology to support science learning. She has considerable experience working with teachers and students from second grade and up, and also has the background and experience in social work and the nonprofit world.

Jim Rebman (started)

will collect relevant information and a shared space for researchers —this means: not just having a set of URLs — but a commented/annotated/extensible shared environment such as Sources.

Colorado Assistive Technology Project (CATP)

http://www.uchsc.edu/catp/

The Colorado Assistive Technology Project (CATP) was founded in 1989. Legislated by the Assistive Technology Act of 1989 and funded by the National Institute for Disability Rehabilitation and Research (NIDRR), the project is a collaborative effort of professionals, family members, persons with disabilities, and other interested parties from throughout the State of Colorado. With its focus firmly fixed on increasing consumer access to assistive technology devices and services, the Colorado Assistive Technology Project (CATP) works to reduce and eliminate barriers to assistive technology.

During the initial five years of the project, efforts were directed toward increasing access to and awareness of the benefits of technology devices and services. In 1994, congress enacted the Amendments to the Assistive Technology Act. At that time States were mandated to direct their energies to the following six priorities:

1. Develop, implement, and monitor State, regional, and local laws, regulations, policies, practices, procedures, and organizational structures, that will improve access to, provision of, funding for, and timely acquisition of assistive technology devices and services;
2. Develop and implement strategies to overcome barriers regarding access to provision of, funding for, and identification of barriers to funding through State education services, vocational rehabilitation services, and medical assistance services, with particular emphasis on overcoming barriers for under-represented populations and rural populations;
3. Coordinate activities among state agencies;
4. Develop and implement strategies to empower individuals with disabilities and family members, guardians, advocates, and authorized representatives, to successfully advocate for increased access to, provision of, and funding for assistive technology devices and services, and to increase the participation, choice, and control of individuals in the Selection and procurement of assistive technology devices and services;
5. Provide outreach to under-represented and rural populations, including identifying and assessing assistive technology needs, providing activities to increase the accessibility of services for individuals with disabilities, training individuals to become service providers; and
6. Develop and implement strategies to ensure timely acquisition and delivery of assistive technology devices and services, particularly for children.

CATP strives to meet these goals through a variety of projects and services. To learn more about the project or to become an active participant, please contact Cathy Bodine at: (303) 864-5100.
For more information contact the: Colorado Assistive Technology Project, The Pavilion, 1919 Ogden, A036-Box B140, Denver, CO 80218, (303) 864-5100 Main (303) 864-5110 TTY, (303) 864-5119 Fax (800) 255-3477.

Building Relationships of Relevance to the Project

1. Gerhard Fischer participated in a European Community / United States collaboration meeting in San Diego (Feb 17 and 18, 2000) — the Europeans have paid special attention to concepts such as “universal access” and “design for all” to incorporate the needs and interests of disabled people. The meeting provided an opportunity to learn more about these efforts and to get to know some of researchers personally.
2. Gerhard Fischer was invited to join the Editorial Board of a new Springer Journal "Universal Access to the Information Society: An international interdisciplinary journal" by the Editor-in-Chief Constantine Stephanidis. This quarterly journal will address technological, human and other issues, related to the goal of universal access and usability in the context of Information Access, Interaction Design, as well as Emerging Applications and Telematic Services.

Participation in Conferences

ACM CONFERENCE ON UNIVERSAL USABILITY

Please be reminded that the submissions deadline for the Conference on Universal Usability (CUU 2000) is May 1. Papers, panels, and posters are solicited for the November 16-17 conference, to be held in Arlington, Virginia. We seek work whose aim is to enable the widest range of users to succeed in their use of technology for information, communications, entertainment, education, e-commerce, community and government services. Five copies of proposals are to be sent to Jean Scholtz, DARPA/ITO, 3701 Fairfax Dr., Arlington, VA 22203-1714 USA (jscholtz@darpa.mil). The diverse set of participants will include researchers, technologists, policy makers, advocates, and users. Visit http://www.acm.org/sigchi/cuu for details.

ASSETS 2000

ACM Conference on Computers and the Physically Disabled November 13-15, 2000, Washington, DC, USA
http://www.acm.org/sigs/conferences/assets00/
The ASSETS 2000 is a conference about computer-based systems to help people with disabilities. The conference's scope spans disabilities and special needs (speech, motor and vision impairments, cognitive limitations and emotional and learning disabilities). Researchers and developers, from both academia and industry, are invited to meet to exchange ideas and present reports on new advances related to these areas. ASSETS 2000 is a conference for presenting research and development. This conference is held in conjunction with CUU 2000, ACM Conference on Universal Usability which will take place at the same location from November 16-17. CUU will focus on access for everyone including people with disabilities.
* See the Call for Participation for more information on the challenges and topics to be addressed, presentation formats, and submission details. * The conference will be held in Arlington Virginia, just across the Potomac from Washington DC at the Arlington Hilton Hotel from November 13-15, 2000. The registration form will be made available at a later date. * The conference is organized to encourage the exchange of ideas. * Members of the Organizing Committee are volunteering their time to help make ASSETS 2000 a success.
Deadlines:
June 3, 2000: submission deadline July 7, 2000: authors notified
Submissions:
Elliot Cole, Institute for Cognitive, Prosthetics
33 Rock Hill Road, Bala Cynwyd, PA 19004
+1 610 664-3585, ecole@brain-rehab.com

Interviewing Researchers (Stefan Carmien)

Researchers at CU to be interviewed:

1. Professor Yoshinaga-Itano — the habilitation and rehabilitation of hearing-impaired individuals from birth through geriatrics

2. Professor Olson — computer-based remediation of reading disabilities and expertise in Dyslexia
3. Professor Richardson — cognitive correlates of decline in daily living abilities of older adults and cognitive interventions in older at-risk drivers

Stefan Carmien's specific goal in the CIAP project is to create a non-trivial, small scaled, and testable software system that will act as a cognitive prosthesis for an individual with a cognitive handicap. I have begun research into two areas: information regarding autism, downs syndrome, dyslexia, and cerebral palsy, and gaining an overview of the state of assistive technology.
In approaching the topic of my proposed project, I realized that becoming an expert in the field of cognitive disabilities, and the 'client's side' of assistive technology in general is not a reasonable goal. A better approach would be to filter the information by researching the literature and interviewing local experts in this domain. Towards this goal, Professor Fischer provided me some possible experts, and I did some research and came up with several more, in the fields of cognitive psychology as well as speech and hearing disability studies. The topics I will cover in these interviews are:

1. What is a cognitive disability?
2. How does it differ from a sensory disability?
3. How are they similar -- can a sensory disability lead to a cognitive disability?
4. How does an assistive technology designed for different disabilities (the two categories above) differ?
5. Discuss the difference between learning tools and living tools.
6. What do you see is most needed in this area (i.e. tools to compensate for cognitive disabilities)?
7. A brief discussion of:
   7.1. Autism
   7.2. Down Syndrome
   7.3. Dyslexia
   7.4. Cerebral Palsy
8. What would be important research directions for this project?

The results of the interviews will be included in the CIAP web site and they will inform our design activites.

Initial Exploration of Existing Technologies

"DynaMyte" augmentative communication Device

(that's what the brochure described it as - I have a copy of the brochure for all the devices made by 'Sentient Systems'). It stood out from the rest as a tool that was not primarily for learning, but to allow persons that could not communicate, to communicate. Interestingly, the one child that we discussed that was using it, took it home on the weekend, and it returned with the programming all 'scrambled up' - a sign that it was actually being used on a personal and day to day basis, as a prosthesis. I intend to follow up in some way with this device - if we (and I) don't end up in the business of making such things, information about design rationale and testing etc. could be very useful from a evaluation of devices and approaches angle.

"Visions"

The other system that is of interest to CIAP was "Visions" a project very similar to "MindTouch" (the CU software project project), with one very important difference - it is being used and more interestingly sold. A system that complex must cost a bunch (I will find out when I interview the designers) and the fact that a number of them have been sold tells us that there is some value, be of real use, to the 'client' using them (we need to find out the 'industry' terms for the users of adaptive technology). Another aspect that may be useful for us is that since this system is several years old we may have access to, or be able to create, some sort of longitudinal study. I understand we are in the process of getting a copy of the video.

Elo TouchSystems

Elo TouchSystems allows you to turn an iMac running your multimedia software into a touch-enabled interactive display. Elo's iMac with iTouch preserves 100 percent of the monitor's brightness, clarity, antireflection, and color properties by placing the touch screen directly on the tube. Read the enthusiastic endorsements for Elo's iMac with iTouch at:
http://www.macobserver.com/newreviews/bc/99/touchscreen/touchscreen.html
http://www.elotouch.com/

Mike Mozer's "Learning House"

As for my house: well, to the extent that it takes over routine functions like controlling the heat, it would be a particular benefit for someone like your subject (the blind and deaf person).
My house project focused on energy and comfort systems, but the idea of automatic/adaptive control could certainly be applied to other arenas. For example

1. if she carried some sort of alerting device, the house could alert her if abnormal conditions arose (leaky water heater, for example), or if someone rang the doorbell, or if a pot was overflowing, etc.
2. the extent to which predicting patterns in her behavior and inferring her activities would be helpful will depend on what sort of behaviors and activities she has in the house.

also: there was a group at MIT that was supposedly talking about home automation for the disabled. don't know who in particular was working on this though. they had an interest in automatically detecting failure to take medicine, injuries, strokes, heart attacks, etc.

Development of a Evaluation Method for Existing Technologies:

We will do interviews with designers of successful systems that act as cognitive prosthesis. Stefan Carmien, as part the collaboration with the assistive technology team at BVSD, has identified two such systems – "Visions" and "Dynamyte" (see above), and we have arranged a tour and an interview with the programmer and system designer of the "Visions" system. The following topics will be discussed with the designers:

1. Describe the steps that lead you to decide to write your own system.
2. Were there other systems that inspired you?
3. Were there other systems that 'dis-inspired' you; i.e. were particularly unsuitable?
4. What was your design rationale? What functions had to be part of the system, and how did you decide to use this particular user interface?
5. Did you iterate over several refinements in your design?
   5.1. If you did:

5.2. How did you evaluate successful parts/versions of your device?
6. Did you use your daughter or another person with her needs to evaluate the system?
   6.1. If you did, what was the evaluation technique?
7. Were there formal specifications you decided that the device had to meet? i.e. performance, cost, platform, operating system etc.
8. What advice would you give to someone attempting to create a useful and well-adopted system such as yours?

Initial System Development Exploration

Shared, collaboratively developed Information Environment: Sources in Dynasite (Stefan Carmien)

for some initial development see: http://Seed.cs.colorado.edu/Sources.Home.fcgi

System Developments: "SPIDER Web"

SPIDER stands for *Sharing Pertinent Information in Dynamically Evolving Repositories*.
The first application of this system will be to support the multidisciplinary research effort that is required for this project. The term "pertinent" in the title of this system is key to its description. It implies that the some information is pertinent to a user's needs, while other information is not. This is one aspect information personalization. As this project progresses it is likely that different research groups will coalesce around different project ideas. This system will help the groups organize their efforts and share relevant information within and among the groups. Information will be shared between group members simply through the mechanism of group membership. Using Latent Semantic Analysis to identify semantic similarities between information in the system, groups will become aware of similar ideas that are being generated by other groups.
Our framework will be flexible enough to support arbitrary types of information sharing. For example, Experience Journals have been used by patients, family members and caregivers that wish to share their experiences with the community. SPIDER Web will allow people that have a common disability to share their experiences. More importantly, however, it will be able to identify similarities between the experiences of people of other groups. This will enable a cross-fertilization of ideas, experiences and resources that might have otherwise gone unnoticed.

Assessment to incorporate some BEA substrates in our Work

The component-based architecture of BEA's systems is exactly the type of architecture we are looking to work with. It will allow for the type of flexibility needed to quickly develop and deploy information system solutions that are tailored to the problem at hand. The WebLogic system may be an application server that we either utilize to build our systems or as an ideal model that will guide our work. Some in the group question whether WebLogic is too complex of a system for us to build upon. It might make more sense for us to develop a more lightweight framework that uses WebLogic and other application servers as a model.
Some of the key features that were most exciting to us were:

- The ability to treat users as members of groups. This allows information to be pushed to people based on their personal or group interests.
- The ability for users to customize their view of information or to "subscribe" to information.
- The system's modular design, which will allow flexible construction for changing needs.

- The separation of the information presentation from the system's business logic. This will allow us to personalize the delivery of information not only by delivering content that is relevant, but also by delivering it in a way which suites the needs of the user (e.g., pictures, text, sound, etc…).

3 Educational Technology House Students (summer)

work description: these students will engage in software development along lines agreed with BVSD special ed teachers; in particular, they will support teachers in creating pictorial representations of concepts for students with cognitive disabilities

Specific Events

ICS Seminar by Jim Rebman

Jim Rebman gave a seminar at the Institute of Cognitive Science on the state-of-the-art in adaptive technologies. Jim has been visually impaired for ten years and has been involved with adaptive technology ever since.
As an exercise, Jim tried to order a book from Amazon.com. It became clear, as we listened to the Web reader that Jim uses to navigate Web sites, how the site's construction made it difficult for a blind person to navigate. Jim eventually found a "text only" link on the site, but it would have been much easier for Jim if the system "knew" he was blind and served the pages in a format that was more well suited for navigation with a device such as a Web reader (→ we will exploit such observations as interesting sources of information for personalization of e-commerce sites).

L3D Symposium "E-commerce: BEA's Component Strategy" with Ryan Martens, March 1, 2000

Ryan Martens, Director of E-Commerce Application Components in the Product Management Division of BEA Systems
ABSTRACT: The talk will provide details of BEA's component strategy, including design principles, solution scope, architecture, and roadmap for their E-Commerce server product.
A follow-up meeting is planned for the near future (no date set yet) where we will visit the BEA Boulder group to get to know more people and understand what they are doing.