Family Center on Technology and Disability

Issue 126

Technology Voices

AI as AT: Artificial Intelligence Technology with Crossover Potential

Defined as the ability of a machine to imitate intelligent human behavior, artificial intelligence has been a focus of computer science professionals since the 1970s. Some of those computer scientists, such as the University of Delaware's Kathleen McCoy, have merged their passion for computer science with other academic disciplines to expand the communication capabilities of individuals with disabilities.

Dr. McCoy is a computer science professor doubling as a linguistics professor. Her areas of research encompass AI, natural language generation, understanding discourse phenomena, rehabilitation engineering, augmentative and alternative communication (AAC) – and assistive technology. Like other researchers with comparable backgrounds, her research on artificial intelligence has drawn her closer to AT and to communication issues confronted by people who are blind and by people who have disabilities affecting their ability to speak.

Dr. McCoy is currently aiding in the ongoing development of Interactive SIGHT (Summarizing Information GraHics Textually), a contextual description of information graphics such as complex charts and graphs in newspaper and magazine articles.

Although designed for blind students, the system has the potential to help sighted students with cognitive disabilities as well as neurotypical students. She expects that the crossover potential of other AI-based graphics systems and AT-type devices is only now being tapped by interdisciplinary researchers and designers.

Kathleen McCoy, Ph.D., Speaks

Before joining the faculty in the University of Delaware's computer science department, Dr. McCoy had had no exposure to disability-related research. Since then, however, she has more than made up for lost time. Her love for the computer science at the heart of much of her AT-related research dates to her early years as an undergrad at Delaware.

"I was very proficient in math in middle school and high school. Yet in college I didn't want to major in math. Then one of my math instructors whispered 'computer science' in my ear. I had no idea what computer science was but quickly learned to love it because it was a discipline in which I was able to use my math skills to obtain direct results. I loved psychology and learning about what made people tick." The confluence of those three interests made artificial intelligence a natural avocation, she recalls.

The pivotal moment that sealed her permanent connection to AI and linguistics occurred in a psychology class. "We were discussing the use of computers to model human behavior, a process that included a language component. Language was another of my interests. I was immediately hooked on the potential of the total package -- math, computer science, psychology and language."

Her link with AT was forged when Patrick Demasco, an AT professional who ran an AAC center affiliated with the university, encouraged her to assist him in developing AAC devices for non-speakers. "I was most intrigued by individuals who were very proficient cognitively but who were unable to speak. I thought, 'What a useful application for the work I've been doing for years, trying to understand language, modes of communication and how important communications capabilities are to those who can't communicate!' At that point I realized I had the ability to make a positive difference in the lives of these individuals by enabling them to communicate much more effectively. This quickly became my mission – and it still is."

We invite you to read, and share with others, the research-based perspective of Dr. McCoy and her insights regarding the positive impact of artificial intelligence and related technologies on the communication capabilities of individuals with disabilities.

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Take a few minutes to check out FCTD's new Powerpoint presentation:

Early Childhood & Assistive Technology

This Family Center resource provides images of AT devices designed for young children and identifies the issues that should be considered when selecting AT for them. Functional areas include: communication, mobility and learning. The Powerpoint briefly discusses IDEA issues and the need to identify AT in IFSP and IEP plans.

http://www.fctd.info/powerpoints

AI as AT: Accelerating the Communication Rate

An Interview with Kathleen F. McCoy, Ph.D., Professor of Computer and Information Science, Professor of linguistics, University of Delaware

Kathleen F. McCoy, Ph.D

"When I began to become immersed in augmentative and alternative communication (AAC) research for people with disabilities that affect their ability to speak, I learned quickly that one of the major issues faced by this population was a very slow communication rate," declares Kathleen F. McCoy, professor of computer and information science and professor of linguistics at the University of Delaware.

Non-speakers, she explains, "communicate via speech generating devices which allow users to enter text which is then synthesized as speech – but the process of inputting text is often very slow, especially for users who have limited motor skills."

The slow rate of communication, she explains, was caused by users' need to type their messages via a keyboard. Accelerating that communication rate, Dr. McCoy states, has been a mission made easier thanks to the advent of artificial intelligence (AI) as assistive technology combined with evolving techniques in natural language generation. Defined as the production, in writing, of an explanation in a context that is understandable to a specific audience, natural language generation has been the object of much of Dr. McCoy's research, with AI eventually serving as the processing mechanism.

AI and Natural Language Processing Are Compensatory Tools

According to Dr. McCoy, artificial intelligence and natural language processing can be used as compensatory tools for children and adults who are non-speakers or who have cognitive disabilities by providing the appropriate phrase rapidly enough to help maintain the natural flow of conversation.

Modeling, she adds, is the key to natural language generation. "If I have a model of how an individual will perform a task or how he/she will need to speak in certain situations, I can program a device to stay a step ahead of the user. If the user becomes stuck somewhere in the process the device can provide a clue as to what an appropriate utterance might be. My job when modeling for natural language generation is to recognize which model is most appropriate to meet the language processing needs of a specific person in a specific situation."

To this point, however, most of her work has been in an experimental vein during a 25-year foundation-building research continuum.

AI and Natural Language Processing: the First Brush

In one of her earliest assistive technology projects that involved AI and natural language processing, Dr. McCoy recalls, AAC users employed a keyboard equipped with content words. "They'd type out a telegraphic sentence, such as 'Apple eat John' as fast as possible. These are very smart people and they don't want 'apple eat John' coming out of their device, because they would not want their listener to get the impression they weren't intelligent."

This project, Dr. McCoy notes, "utilized computerized speech and natural language generation technology to put syntactic tissue around words like apple,

eat, John in order to produce a phrase or sentence like, 'The apple was eaten by John.'" She explains her thought process as she devised syntactic support: "I know what apple means; I know what eat means and I know what John means – and I know how those words can fit together in a sentence. Apples don't eat. People eat -- food items. What's needed is a full sentence that can be generated by the AAC user's device so that listeners can understand the meaning in a way that would be appropriate for the user to have uttered it without the speaker having to perform time consuming keyboard work to generate, thus disrupting conversation flow."

In that example of early natural language processing, she says, "I used semantics about the meaning of individual words; I used 'eat' and the nouns that 'eat' expected semantically. I also used syntax such as adding "The" before 'apple' and adding a tense. I used 'eaten' a past participle verb, in order to produce a full sentence to be generated in the correct context." In cases where the user's original input was ambiguous or the word order could not be maintained, the system presented the user with several utterances that they could choose from. Dr. McCoy and her project research partner, Patrick Demasco, found the verbal knowledge base required to fuel the system too cumbersome. "Our prototype system in 1992 took us quite a way toward our goal but was never actually affixed to an AAC user's wheelchair."

SceneTalker: Speeding Communication by Storing Whole Utterances

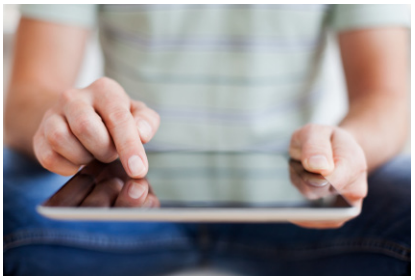
Her current research, she adds, employs AI and natural language processing to produce stored utterances. "As always, the objective is to restrict the number of a user's required keystrokes while providing quickly accessible stored utterances for use in specific scenarios."

Her vehicle for stored utterances is SceneTalker, an utterance-based AAC system that facilitates the selection of full messages. Devices such as SceneTalker, she explains, "have the potential to significantly speed-up the communication rate, but they pose interesting challenges, including: anticipating text needs, remembering what text is stored, and accessing desired text when needed." Moreover, she adds, "using such systems has profound pragmatic implications, as a pre-stored message may or may not capture exactly what the user wishes to say in a particular discourse situation."

SceneTalker, she notes, is a prototype research-driven, utterance-based system designed to speed the communication rate for speech-impaired individuals by storing whole utterances for use in contextually appropriate situations that require multiple responses. She cites going to a restaurant as an example. "Most of us carry in our heads a script for what transpires when we visit a restaurant. The typical scenario calls for us to ask for a table, be seated, order appetizers and drinks, order a main course and dessert, interact with the waiter throughout and pay at meal's end. Easily accessible utterances would be stored for each of those scenes."

Although the potential users of this system are non-speakers, she says, it could also be effective for individuals with cognitive disabilities by enabling them to step through prescribed actions supported by appropriate contextual language, a process, she says, that qualifies as a cognitive aid.

Interactive SIGHT: Accessing Graphics in Popular Media



"Most writers when composing newspaper or magazine articles don't think about readers who are blind," Dr. Mc-

Coy notes. As part of a team led by University of Delaware colleague Sandra Carberry who initiated the underlying project, Dr. McCoy is helping to develop a system called Interactive SIGHT (Summarizing Information GrapHics Textually), which provides visually impaired individuals with the high-level knowledge gained from viewing information graphics in electronic documents.

SIGHT, which is implemented as a browser extension, works on simple bar charts. Once launched by a keystroke combination, SIGHT first provides a brief initial summary that conveys the underlying message of the bar chart along with the chart's most significant features. The system then generates history-aware follow-up responses that provide further information upon user request.

According to Dr. McCoy, SIGHT user evaluations with sighted and visually impaired users revealed that "the initial summary and follow-up responses are effective in conveying the informational content of graphics and that the system interface is easy to use."

Currently, SIGHT provides contextual synopses of simple bar charts and line graphs found in popular media, but its vision component is somewhat limited. Work continues to extend the capability to include other types of graphics, such as grouped bar charts or line graphs with multiple lines.

SIGHT is delivered via a browser helper object (BHO), a component of Microsoft's Internet Explorer web browser application. The BHO, she explains, is an add-in designed to provide or expand the functionality of the browser and allow developers to improve the web browser with new features.

Declares Dr. McCoy: "When people who are blind 'read' an article, the graphics incorporated into the article are largely inaccessible. If the article is on the web the graphic is supposed to contain ALT text, which enables text written by the graphic's author to be displayed by the browser when the cursor is run over the graphic. But the ALT text is often absent." According to Dr. McCoy, there have been some attempts to make graphics accessible for people who are blind. "Much of that effort has been focused on what I call 'scientific graphics', i.e. graphics utilized for visualization purposes; when I run an experiment and want to understand what happened, I'll graph my data, a process that lets me see the relationship between the items I'm graphing."

Researchers in this area, she points out, "have attempted to alert readers to the content of a graphic by playing musical tones associated with the data points (for example). The tones go up or down depending on the referential y axis. The tone helps readers understand a graphic's content." Yet, she cautions, "learning to read a scientific graphic is hard work even for sighted individuals."

Dr. McCoy's team chose information graphics in popular media (such as USA Today) as the SIGHT experimental vehicle because such publications, she notes, make use of information graphics to enhance the content of an article. In USA Today, for example, "there's a daily graphic on the bottom of the front page. My eyes travel immediately to that stand-alone graphic. I look at it; I don't study it. If I'm interested in the content I'll examine it more closely.

"We find that in popular media each graphic has a purpose. Each graphic provides a message or a nugget of information that is sometimes not repeated or

referred to in the story text. Someone who is blind and does not take note of that graphic and its content misses that part of the article. Those are the graphics we focus on."

Such graphics, she states, can serve multiple purposes. "When I read those graphics I don't examine every data point. I glance at the graphic to get a sense of what it's trying to tell me. Why? Because the graphic designers designed that graphic to illustrate a single point. The designers may have elected to use a bar chart because they wanted to highlight a specific message. They may have chosen to color one of the bars differently than the others so that they could emphasize that bar.

"There are choices that are made in design. We as a team try to recognize the specific message, the underlying intention, of a graphic. We generate a piece of text that clearly presents the graphic's major point of emphasis by analyzing the communicative signals that the graphic designer employed."

That emphasis, she continues, "can be in the form of colors or the type of graphic used. There's information in the caption, although a caption alone rarely tells a reader the entire message. Recognizing that there are graphics to which the reader returns due to piqued interest, SIGHT enables the reader to obtain more information. We highlight a graphic's main thrust -- but more information is also available for the interested reader."

Depending on the severity of the vision loss, vision-impaired users, Dr. McCoy explains, might use a screen magnifier or, for those with more severe vision loss, a screen reader such as JAWS to access documents. "We've conducted evaluations of our system with individuals who are blind or visually impaired and who use screen readers and screen magnifiers. Screen magnifiers can be effective for individuals with some vision impairment because the device can adequately enlarge the type size to facilitate readability. Often a graphic can be seen with a screen magnifier but not understood because it has to be enlarged so much that only a small portion of it can fit on the screen at a time. Our system is helpful for these individuals.

"When the screen reader device encounters a graphic, it simultaneously encounters ALT text which the SIGHT system has added, which indicates the presence of an information graphic (bar chart or line graph). The ALT text instructs the reader to press ‹CTRL›-Z to launch the SIGHT system and to receive a content summary read by the screen reader. At the conclusion of the summary the device reviews a menu of buttons for the reader to press according to the reader's level of interest or desire to exit the system."

"GPS for the Blind" and Other Emerging AT Trends

An active member and frequent presenter at numerous computer science and linguistics conferences worldwide, Dr. McCoy is exposed to nascent AT trends in both fields. Here are some the trends she sees taking shape:

Wayfinding – "Some members of the Association for Computing Machinery (ACM) are becoming increasingly interested in wayfinding (http://www.ap.buffalo.edu/idea/udny/section4-1c.htm), the ways in which people and animals orient themselves in physical space and navigate from place to place.

"If a blind person is in a building with which he/she is unfamiliar and is attempting to locate a specific room in that building, he/she not only wants to reach the right destination but desires to do so without collid-

ing with objects such as walls, doors and furniture, for example. He/she needs to find a route, even if the individual is not only blind but also in a wheelchair – in which case locating a stairway won't be helpful, but an elevator, on the other hand, would be. In the formative stages are small devices that can help plan an internal or external route and disseminate that route in a way that it will be helpful. It's like GPS for the blind."

Wayfinding, she says, continues to be assessed for its usefulness among those with cognitive impairments." Such a device would, for example, aid a child in finding the correct bus or help a child if the child has boarded the wrong bus by providing proper directions and cues." There are wayfinding devices in the prototype phase, she points out.

Games for the blind – "Guitar Hero was a very popular game that still has fans," Dr. McCoy recalls. In Guitar Hero, players are provided with their cues on-screen. "To date, individuals who are blind have not been able to participate. Now, however, researchers are rigging finger sensors which provide a pulse that indicates to blind players which key should be pressed."

Speech synthesizers – "Blind people read articles through screen readers. Often, however, a reader who is blind and wants to forge ahead quickly through the material accelerates the presentation so that the words are crunched together. While that accelerated presentation is incomprehensible to sighted people, blind individuals who are accustomed to it can understand it. There was a study presented this year on how understandable different voices are to people who are blind when used at this fast speed. This would be helpful in choosing a voice for a screen reader. This selection process is important for sighted designers to consider and understand. An understandable voice reading at what sighted people consider to be a normal pace might not be effective when accelerated. This highlights the importance of analyzing and evaluating the effectiveness of technology with people with disabilities as they might use technology in unique ways. This study is a reminder to the field to ascertain how individuals with disabilities utilize technology and that what is deemed effective in one situation might be far less effective in another situation."

The study, she continues, is a lesson for the computer societies that are considering the application of computer science for individuals with disabilities. "We need to engage the target users in order to ascertain how they use the technology. If I invent a device that's effective for someone without disabilities it may not be effective for the target population because the target population will use the technology differently."

Games for Autistic Children – "I've noticed over the past couple of years that autism is an area of technology activity, mainly involving computer games. These games are aimed at engaging an autistic child and encouraging a child to interact by making vocalizations, creating words. The gaming environment may also encourage sharing or turn-taking or the development of social skills that can prove to be illusive for some children with autism. "

Sign Language and mobile devices -- For the past several years, Dr. McCoy says, ACM conferences have focused on the needs of individuals who are deaf and use sign language. Sign language recognition has been a hot topic. Systems are under development that can recognize sign language and transmit sign language via video and even mobile phones. Speed is an

issue. The typical video runs about 30 frames a second. That's much too slow for signing which might involve very quick movements. Here, too, issues of comprehensibility are being examined. We're asking, 'What's the most important part of this video to get across?'"

Sign language avatars — Sign language avatars – animated figures who sign —- are being designed that transform spoken words into sign language. "Researchers are trying to ascertain what is most important to capture from that avatar. It's not just the hands and the hand shapes; the face and facial expression are also factors whose significance is being judged. At this year's ACM SIG (special interest group) ACCESS conference there was a full-day workshop on sign language translation and avatar technology."

Story telling for non-speaking children -- A child-friendly system on a mobile device are being designed to accommodate the following scenario: "There's a non-speaking child in a school who wants to tell his/her parents about what's occurred in school each day. This is a very difficult task for a non-speaking child. Inputting a daily account into a device would require too much time and effort on the child's part even if the child was able to master the input process."

One solution calls for the child's school-based caregiver to input a message for the parents. Researchers are working on a system that would combine messages spoken by teachers and caregivers during the day with other information to allow a child to tell a story of interesting events that occurred that day. For instance, she says, "a system that would recognize bar codes on swipe cards and classroom doors that log in a child's entrance or departure. This system is connected offline to the child's class schedule. Say the child enters a math class which is taught by a substitute teacher. The system would assemble a message that reads, 'I was in math class today but Mrs. Smith was absent.' The child could then use his/her device to relay that message to the parents. The system also enables a caregiver to take a photo with an accompanying voice message that also becomes part of the child's daily story for parental consumption."

Phonic Stick – Another system for non-speakers, Phonic Stick (http://www.dundee.ac.uk/research/media/D373PhonicStick.pdf) , operates without the need of a visual interface and generates phonemes, the smallest phonetic unit in a language capable of conveying a distinction in meaning, such as, in English, the m in 'mat' or the b in 'bat'. "When fully developed," Dr. McCoy says, "the device will enable users to blend phonics into any words by positioning a joystick and to 'speak' these words using a speech synthesizer."

AI for people with aphasia – Under development is artificial intelligence technology designed to help people with aphasia who have lost the ability to articulate ideas or comprehend spoken words. "A speech generating device I saw this year at a conference emulated the way someone with aphasia speaks by inputting a normal spoken sentence and transforming it. Aphasia is an area of hot interest in which several organizations are developing devices. Lingraphica (http://www.aphasia.com/?gclid=CJTrn7-_0K0CFUPd4AodfRdYlw) has been active in this sector for some years but now others are active as well."

Yesterday's Magic, Today's Technology

Although Dr. McCoy did not view AI, the 2001 Spielberg depiction of a world in which artificial intelligence has not only become ubiquitous, but dominant, she notes that what was yesterday's fantasy

has, in part, become today's reality.

"Years ago, when the movie appeared, AI was thought to be a world-changing field. What we're finding is that much of the AI capability highlighted in the movie is incrementally becoming part of everyday technology. For example, Google can be utilized as a translation vehicle when visiting abroad. I used it often when I visited Italy recently. The appearance of AI features in technology – including AT -- is now becoming almost commonplace."

Because the technology has become more ubiquitous, the public, she contends, may no longer view today's artificial intelligence as exotic and dramatic. "But it's the same technology that intrigued Stanley Kubrick and Spielberg when they conceived the scenario for AI. The magic of artificial intelligence is that the magic isn't magic anymore."

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Is Your Organization's Listing in the FCTD Database Current?

There are more than 4,000 organizations listed in the FCTD organizational database. We continually update the entries, but there are more of them than us (by about a 2,000 to 1 ratio) so we hope you'll help by checking your own organization's entry from time to time. Please let us know if you'd like to make changes to either the contact information or the description of mission and activities.

You can access the database at:
http://www.fctd.info/organizations
and you can email us at: fctd@fhi360.org

Thanks!

RESOURCES

ARTICLES

Differentiated Instruction

Implications of Pragmatic and Cognitive Theories on the Design of Utterance-Based AAC Systems
By Kathleen F. McCoy, Jan Bedrosian and Linda Hoag
NAACL HLT 2010 Workshop on Speech and Language Processing for Assistive Technologies, pages 19–27 (2010)

Utterance-based AAC systems have the potential to significantly speed communication rates for individuals who rely on speech generating devices for communication. The challenges in designing such systems include: anticipating text needs, remembering what text is stored, and accessing desired text when needed. Among the pragmatic implications associated with these systems is accurate appropriate message capture for pre-stored messages during discourse sessions. The authors describe a prototype of an utterance-based AAC system whose design choices are based on findings from theoretically driven studies concerning pragmatic choices with which the user of such a system is faced. These findings are coupled with cognitive theories to make choices for system design.
http://aclweb.org/anthology/W/W10/W10-1303.pdf

WEBSITES

MyTalkTools.com

This is a website resource for the AAC iPhone/iPod application MyTalk, which helps those with expressive language disabilities to use their iPhone – including iPhones loaded with users' personalized audio and visual language sets. The site provides MyTalk subscribers with private online storage and authoring for their personalized library and the

elements essential to their language set. A public images library and a best practices forum are also available. http://www.mytalktools.com/dnn/

Geek SLP

Created by speech-language pathologist Barbara Fernandes, the founder and developer of Smarty Ears, this website reviews speech-language applications and discusses technology and apps for use in the classroom. It offers tips on using iPods and iPhones, iPads, Androids and other computer systems in speech-language therapies for auditory-verbal difficulties, autism, aphasia, AAC, and language delays. Geek SLP includes resources for parents and teachers, how-to articles, event listings and a shop to purchase applications.
http://www.geekslp.com/

VIDEOS

AAC around the Globe

This 2010 video, created to commemorate 2010's International AAC Month, demonstrates the effectiveness of a wide range of communications devices employed by the video's creators, three teenage girls, all AAC users, from Australia and the United Kingdom. In the video the girls tell their individual stories while explaining how various devices help them remain connected to each other over vast distances and how the devices have connected them individually to their immediate communities. Utilizing email, the girls collaborated in the creation of their videos, which include PowerPoint presentations and accompanying audio and photos.
http://www.youtube.com/watch?v=JGQ7wCsT3AY

The Language Stealers

This advocacy video promotes the use of "language boards of core words" by AAC users, in lieu of worksheets of lesson nouns. The video encourages phoneme-based literacy instruction and advises teachers and parents not to attribute language delay to lack of cognitive ability.
http://www.youtube.com/watch?v=Vib2__BDCXc

GUIDES

Emergency Communication for People Who Have Limited Speech

Website: aac-rerc.psu.edu

This resource is a comprehensive guide to emergency preparedness for individuals with complex communication needs (CCN). Three target audiences are identified: AAC users, AAC advocates and disaster and emergency personnel. For each group, there are guidelines that address rescue and support needs and activities for each phase of an emergency. For example, for AAC users the guide recommends a pre-existing evacuation plan, a support team, a 'Go Bag' and a low-tech basic communication system. Rescue personnel, the guide notes, should make adequate preparations to communicate with speech-impaired individuals.
http://aac-rerc.psu.edu/index.php/pages/show/id/4

LISTSERVS

Augmentative Communication Online User's Group (ACOLUG)

Affiliated with the AAC-RERC, ACOLUG is an international Listserv of people who use AAC and families of young children who use AAC. It provides both a "virtual AAC community" and a link between individuals who use AAC and the RERC. While not the primary focus of ACOLUG, other interested stakeholders – university students, practitioners, policymakers, and manufacturers – may join as active members or as observers. ACOLUG subscribers around the world post an average of 250 messages monthly. Subscription is free via http://listserv.temple.edu/archives/acolug.html. More information is available at:

http://aac-rerc.psu.edu/index.php/projects/show/id/18

SOFTWARE

eType

eType is a free word prediction/dictionary/translation program for Windows. The eType program works with a variety of online and offline products, including MS Word, Gmail, Outlook, Twitter, Facebook, Windows Messenger and Blogger. EType works with Windows XP and Windows 7 systems and can be downloaded from the eType website. http://www.etype.com/

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New FCTD Fact Sheet AT SOLUTIONS

FCTD's new AT Solutions fact sheet provides illustrated examples of a range of AT products to help parents who are beginning their search for assistive technology. The fact sheet includes basic questions to be considered when trying to identify assistive technology devices that will best suit your child. Each AT example has an icon indicating whether it is high-tech, mid-tech or low-tech. Although we've included sample vendors for your convenience, please note that FCTD does not endorse specific products or vendors. Most products are available through a number of reputable vendors. When listing AT devices in an IEP it is best to identify a product type and not a particular brand name.

http://www.fctd.info/assets/assets/19/AT_solutions-2011-FCTD.pdf?1322842743

KNOWLEDGE NETWORK MEMBERS

Adaptive Technology Center for New Jersey Colleges

Association of Computing Machinery (ACM): Special Interest Groups:

ACM, an international education and scientific computing society, maintains special interest groups focusing on accessible computing (SIGACCESS) and artificial intelligence (SIGART). SIGART studies the realization of intelligence in computer systems and its application in finding solutions to disability-related problems. A special interest group dedicated to assistive technology is in the development stage.
In addition to sponsoring an annual international conference SIGACCESS publishes a tri-annual digital newsletter, Accessibility and Computing.
For more information, contact:
Association of Computing Machinery (ACM)
2 Penn Plaza, Suite 701
New York, NY 10121-0701
Phone: (800) 342-6626 (toll free, U.S. and Canada); (212) 626-0500 (Global)
Fax: (212) 944-1318 (Global)
Email: acmhelp acm.org
http://www.acm.org/

Alexander Graham Bell Association for the Deaf and Hard of Hearing (AG Bell)

Founded in 1890 by Alexander Graham Bell, AG Bell, via chapters in 31 states, provides programs and services pertaining to pediatric hearing loss and oral/deaf education. For families whose child is experiencing hearing loss, the association pro-

vides orientation information in the following areas: how hearing works, types of hearing losses, the definition and benefits of early intervention, communications options, choosing a communications approach, hearing technology, and emergency preparedness. Benefits for parents include: a free six-month AG Bell membership, parent advocacy training, and financial aid opportunities

For additional information, contact:

Alexander Graham Bell Association for the Deaf and Hard of Hearing

3417 Volta Place, NW, DC 20007

Phone: (202) 337-5220 (202) 337-5221 (TTY)

Fax: (202) 337-8314

Contact: K. Todd Houston, Executive Director/ CEO

Email: thouston@agbell.org

www.fctd.info/organizations/1249

U.S. Society for Alternative and Augmentative Communication (USSAAC)

USSAAC addresses the informational and AAC device needs of persons who are non-speakers or speech-impaired; their families, therapists and educators; researchers; disability professionals and AAC manufacturers. The society's tri-annual peer-reviewed digital publication, Speak-Up (http://www.ussaac.org/speakup.htm), features AAC research, clinical practice, intervention, language, outcomes and articles about or from AAC users and family members.

For more information, contact:

U.S. Society for Alternative and Augmentative Communication

100 E. Pennsylvania Avenue, Courtyard

Towson, MD 21286

http://www.fctd.info/organizations/3587

Center for Hearing and Communication (CHC)

The center provides hearing rehabilitation and services – including AT, advocacy, community outreach and volunteer programs – for deaf and hearing-impaired infants, children, adults and their families regardless of age, ability to pay or mode of communication.

For further information, contact:

Center for Hearing and Communication

50 Broadway, 6th Floor,

New York, NY 10004

Phone: (917) 305-7700 (917) 305-7888 (TTY)

Fax: (917) 305-7999

Email: info@chchearing.org

http://www.fctd.info/organizations/1866

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