Eye Gaze System Makes Communication “Easy” for SHARE’s First Client

Smaller, faster and more efficient. Those are just a few of the words used to describe a new communications system on loan to SHARE’s original client, Linda Texceira, by Boston Children’s Hospital.

Linda is using an “eye gaze” system these days. The small screen features letters of the alphabet and other common keyboard items such as punctuation and numerals. She focuses her eyes on each letter, spelling out the words she wants to use, and they appear on the screen much more promptly than her earlier systems.

Linda has been using a scanning computer system for more than 30 years. In a scanning system, letters of the alphabet, numerals, words and control functions are arranged in rows and columns on a computer screen.

Scanning systems are very reliable, but they are slow and they require concentration. Linda controls her scanning system by pressing her head against a switch mounted on her wheelchair behind her head.

The eye gaze system is referred to as a “direct select” system because the user can select any item on the screen just by looking at it. There is no waiting for the system to present items sequentially.

“It’s the first time she can carry on conversations without having that long response time,” notes Martha Texceira, Linda’s mother. “And she doesn’t get as tired now that she doesn’t have to tap the switch anymore.”

New Lab Helpful to Center’s Work

The new IDEAStudio at UMass Dartmouth features equipment that Center Rehabilitation technologist Mark Whittaker says can make his work faster, neater and more efficient.

The IDEAStudio, an acronym for Innovation, Design, Engineering, and Art Studio was given to UMass Dartmouth by alumni Chip Hildreth ’85 and Sue Hall ’85 with the idea that it would be used to facilitate collaboration between engineering and art students.

The lab features a 3-D printer, a laser cutter and engraver, and several types of software.

The laser cutter is a great tool,
**Eye Gaze System**
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Linda describes it this way: “It’s easy.” Another perk of the current eye gaze system is that as Linda is directly selecting letters with her eyes, word “predictions” appear, giving her suggestions as to what words she may be seeking.

Communicating by fixing her eyes on letters is not new for Linda. When Professor Lester W. Cory first learned about her through a newspaper story back in 1981, the young woman with cerebral palsy was “speaking” to her parents with the help of a Plexiglas letter board created by her father Al.

Prof. Cory and his colleague Prof. Phil Viall built her a communications system—a large, bulky computer. And the rest, as they say, is history. The SHARE Foundation was established so others, like Linda, could make their wants and needs known and lead more independent lives.

To date, SHARE has assisted nearly 3,500 people with a range of disabilities, and it all began with her. Over the years, Linda has worked with about a half-dozen different systems, each one getting “better and better,” according to her parents. She loves using her computer to write letters, make cards and visit with company.

During a March visit to the Center for Rehabilitation Engineering office at UMass Dartmouth, Linda’s first message was: “I’m ready for spring!” “If it wasn’t for Les and Phil and SHARE, it would have been like playing charades all of her life,” Mrs. Texceira says. “We all hold them in the highest regard.”

Prof. Cory, in turn, says of Linda: “She changed my life.”

He explains that each system Linda has used has evolved from its predecessor. The first large TRS-80 model 3 with floppy disks was

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**Special Scanner Technology Brings Independence to SHARE Client**

A special scanner was recently delivered to George, one of SHARE’s clients, making it possible for him to use one switch for four functions.

Friends of SHARE may recall George’s story in last year’s annual appeal letter. He is a man in his early 50s, living in a nursing home with a condition called ALS, known as Lou Gehrig’s disease. George can no longer speak and has very little physical ability, relying on a respirator to breathe. He uses his eyebrows and eyes to signal “yes” or “no” and is able to raise some fingers.

The Center’s Rehabilitation designer Mark Whittaker says that George’s new device selector allows George to independently operate a television, use a speech recognition program on his computer for communication, control his PC and use the call system to garner an attendant.

Mark explains that in the past, George would have to call someone to unplug and plug back in his equipment in order to change tasks. Now, for example, if a visitor comes to his room and he wants to shut off the TV and “speak” through his computer, he can do so by hitting the switch and holding it down and then releasing it while it scans to the next activity.

“Now he can switch it himself and do anything he wants to do,” Mark says.

One of the challenges of developing the system involved timing, he adds. For example, if George needs to use the call button suddenly and he is doing something else, he has to hold the button down while it moves through two or three other functions to get to the one he needs. Mark says the design was made to keep the time that change would take to a minimum, while still not going too quickly to risk accidentally triggering something else.

Mark adds that the client is “overjoyed” to be able to perform tasks on his own and not have to rely as heavily on someone else. He says that this function “quadplexer,” the first of its kind, would be extremely helpful to other clients seeking to perform multiple functions, and he expects to be developing more in the future.
says Mark, because it is ideal for making custom plastic enclosures. He explained that whenever he designs a circuit board for a client, it needs to be put in an enclosure. Previously, he purchased off-the-shelf boxes that were seldom exactly the correct size and always required drilling or machining holes for switches, jacks or cords. Today, Mark specifies the exact enclosure dimensions and hole layout using a CAD program which outputs data to the laser cutter, and the result is a precisely cut enclosure that is ready to use.

“These cutouts are mechanically made from my drawing and they are perfect,” Mark said. “The cutouts can be done in 30 seconds and they simply snap together. You can also engrave the client’s name or other information on it using the laser engraver.”

The laser cutter has also enabled Mark to fabricate some very fine stencils that he uses to apply solder paste to printed circuit boards. This tool makes it possible for him to use the latest surface mount technology when designing new products for our clients.

Lately, Mark has been experimenting with the 3-D printer and is excited about the prospects of using it to custom fabricate equipment for clients in the near future.

SHARE Makes a Difference, Caregiver Says

In 2010, “Debby” watched her partner “Donna” experience a major flare of multiple sclerosis that left her quadriplegic, nonverbal and limited to a wheelchair and bed. Debby recalls three years of her friend cycling between hospitals and rehabilitation stints, a period that she calls “not the best situation.”

Therefore, when she heard about SHARE and the work it funds at UMass Dartmouth’s Center for Rehabilitation Engineering, it prompted hope and excitement. Client Services coordinator Beverly Thorn made several visits to their home to determine the optimal ways for Donna to begin doing more activities independently.

Donna can move her right foot, so the Center designed a foot switch that works with a modified infrared remote controller to enable her to control her television set and listen to music through her cable box. She can also use the same switch to summon help by means of a modified wireless chime that rings at the far end of her home.

For communication, the Center supplied a computer system running Speaking Dynamically Pro. Although she cannot speak, Donna can reliably make a nearly inaudible sound. To take full advantage of that ability, the Center gave her a throat microphone connected to an InvoTek Voice Switch. When she makes a sound, the voice switch sends a signal to the computer. By controlling when she makes sounds, Donna can select which of several dozen pre-stored sentences the system will speak. The Center staff is working with Debby and Donna to develop a more useful vocabulary list to enable Donna to convey almost anything she needs to say.

“Donna was so happy after three years to be able to change the TV channel herself. I can’t even tell you how exciting it is,” Debby says. Similarly, she describes how Donna can pick the phrases she wants to say or indicate “yes” or “no” with the help of a computer.

“It’s amazing to give someone control of being able to work with a computer this way,” Debby says. Noting that Donna previously worked as a psychological counselor and social worker, Debby has noticed a change in her partner’s demeanor.

“It brightens her…takes away her boredom and stimulates her mind,” Debby says. “To have this equipment gives her so much back and is a blessing.”

She adds that working with SHARE and its personnel is a “remarkable gift. They’ve absolutely made a difference in Donna’s life.”
THANK YOU! We extend our gratitude to the many supporters who have donated to SHARE over the past few months. Your generous gifts are making it possible for us to provide the opportunity for independent communication to more children and adults with disabilities.

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