The **isaac**™ System

Equipping People for Independence

System Overview

ISAAC™ is a small, individualized, wearable cognitive prosthetic assistive technology system developed by Cogent Systems, Inc. Because it is fully individualized and so easy to use, ISAAC is appropriate for individuals with a wide variety of cognitive disabilities. The range of applicability extends from individuals with developmental disabilities (such as mental retardation) to high functioning brain injury survivors, including many stroke survivors and individuals with dementia.

Because the system is battery powered and wearable, ISAAC users can have access to fully individualized information and prompting content in almost all environments, throughout the day. The system is applicable in vocational and independent or supported living situations, and combinations of these.

System Description

The ISAAC system device is based on advanced mainstream, state-of-the-art electronics and battery technologies, allowing ISAAC to deliver powerful capabilities at a low cost. The device is designed to be worn and accessible throughout the day with the use of the ISAAC case and carrier. It is large enough for the touch screen to be easy to use, while still being compact enough to be used while being worn. In fact, when folded to its closed position, it is about the size of many popular "fanny packs". The system is powered by long life rechargeable batteries that reliably last all day and are recharged overnight while the user sleeps. The batteries are contained within the ISAAC case and are not normally removed for any reason. They are even recharged while in the case. This type of battery does not suffer "memory" effect and with normal daily use in the ISAAC system the batteries have an expected life of about two years.

The ISAAC system software on each ISAAC user device enables the presentation of the user's individualized prompting and procedural content. It also enables the user, by means of "virtual buttons" created on the touch screen of the ISAAC device, to initiate access to the desired content when it is needed.

There are two broad classes of content. One is system-initiated prompting, which is delivered to the user as synthesized speech audio in either English or Spanish. Each system-initiated prompt is defined based on a specific condition such as the day of the week and time of day, the time interval from a specified user interaction with the system, the sequence of prior user interactions, etc. Most types of system-initiated prompts require user acknowledgment by means of the touch screen, otherwise they are repeated at a specified time interval until they are acknowledged or superceded by a more appropriate prompt.

System-initiated prompts can be used for an almost endless list of purposes, including providing basic structure to the user's day (prompting key activities from first thing in the morning to the last thing before bed at night), supporting employment success (example: detecting off task behavior and delivering a corrective prompt), and implementing quality measures (example: detecting out of sequence performance of procedural elements and delivering a corrective prompt).

The other class of content is information that is accessed directly by the user --- user-initiated content. This may be procedural information for tasks or simply information that the user needs to access periodically, such as telephone numbers, directions to locations, etc. and can be in presented English or Spanish. The ISAAC system user accesses this class of content by navigating to it, when it is needed, using the virtual buttons on the touch screen of the ISAAC device.

The virtual buttons are labeled with either text (in English or Spanish) or graphics. Since they are always visible, they provide constant reminders of what information is accessible. The user doesn't have to remember what information is available, what notebook it's in, or what keyword is required to access it. The virtual buttons are organized hierarchically into "threads" of content, from general to specific, providing an intuitive path to the information the user wishes to access.

The desired content can be presented to the user in either English or Spanish in the form of text, graphics, or synthesized speech audio output. Text output can be in the form of either a simple list or a checklist that enables the user to maintain procedural orientation by simply touching the screen to check off each item as it is completed. The content developer makes the content appropriate to the individual capabilities of the user by controlling the "depth" of the hierarchy of content, the type of navigational labels (text or graphics), the content output medium (text, graphics, or spoken audio), and the specific information presented.

<u>Individualized Content Authoring</u>

The individualized content needed by and appropriate for each ISAAC system user is developed by an Authorized ISAAC Services Provider[SM] or Qualified ISAAC Services Practitioner[SM]. No computer programming and only the most basic PC skills are required to do this. Practitioners use ISAAC Author[TM], a separate authoring system software that runs on a standard desktop or notebook PC, to develop and update ISAAC system content. The authoring system, which looks a lot like a simple word processor when in use, has been developed to facilitate the entire process of individualized content development and updating. When the content elements for an ISAAC system user have been fully developed, the practitioner simply connects the user's ISAAC device to the serial port of the PC using the provided cable and downloads the content to the device. An ISAAC system user's existing individualized content can also be updated, refined, and modified using ISAAC Author.

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Performance Data Log

Another feature provided by the ISAAC system is logging of user performance data. The performance log provides a snapshot that extends over multiple days, listing every user interaction with the system content during that period. In addition to listing user actions and the content presented as the result of user initiation, the log also lists the system-initiated content that was presented to the user. The log data indicates the sequence, date, and time of each user action and content element presentation. Log data is stored in a standard format, so that uploaded log files can be imported into most word processing, spreadsheet and data base programs for printing and analysis.

Logged data has many uses. It can be used to adjust and refine the user's individualized content during the initial training period. It can later serve to provide an objective picture of how the system is being used --- which content areas are used most, which are not used, and which appear to be used incorrectly. This analysis can help identify if additional task or behavioral training is needed and if content modification is indicated. In addition to helping prevent problems in community living and employment situations, the logged data can also assist a user's advocate if a situation arises such as when an employment supervisor's incorrect impression needs to be dispelled by objective evidence of the user's performance or as documentary proof that prompts (for medications, hydration, meals, vital activities, etc.) were delivered to, and acknowledged by, the user.

Further Information

For more information about the ISAAC system or how to become an Authorized ISAAC Services Provider or Qualified ISAAC Services Practitioner, visit Cogent Systems, Inc. at www.cosys.us or email rdayle@earthlink.net.

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