

Development of Digital Pen-type Transparent Kana Board Communication System

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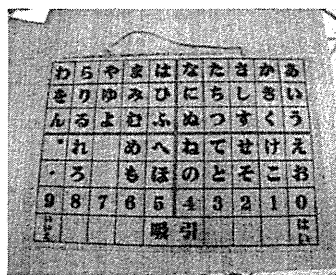
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Communication Support for people with severe physical disabilities

- ▶ For people with severe physical disabilities
(amyotrophic lateral sclerosis (ALS) patients or
muscular dystrophy patients etc.)
- ▶ it is difficult to speak, write down or type keyboard
to communicate with caregivers or others.
- ▶ One technique called Eye-link is utilized for these
patients to communicate with caregivers.

Eye-Link Communication Technique

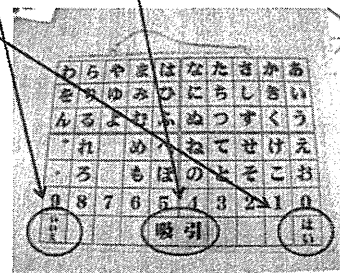
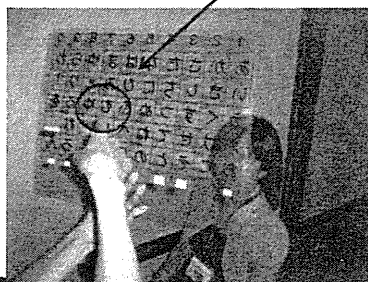
- ▶ The Eye-link technique use a transparent board
- ▶ Transparent board is gridded sheet of acrylic or other transparent materials.



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Eye-Link Communication Technique

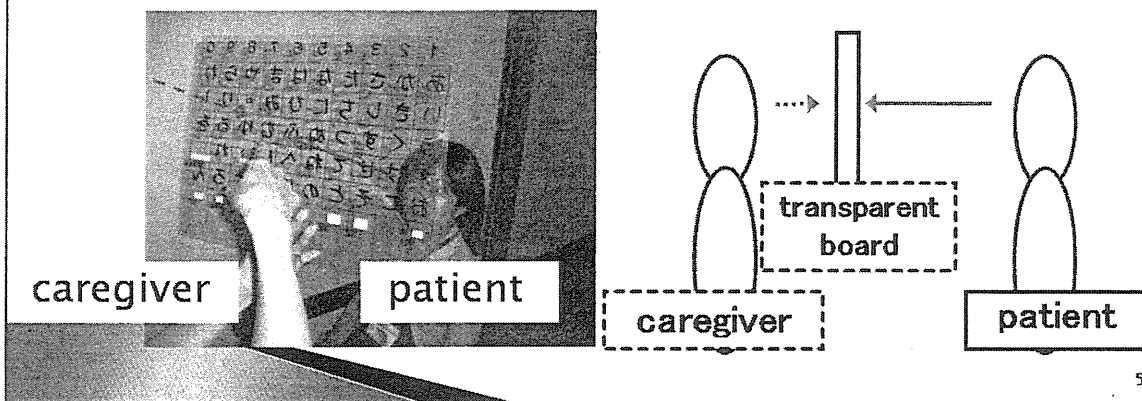
- ▶ In this technique, caregiver holds a transparent board.
- ▶ And, the patient visually fixates on the cell containing the desired letter or frequent used message element (Yes, No, Aspiration, TV-ch, etc.).



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Eye-Link Communication Technique

- ▶ The caregiver holds the board inverse then slowly moves the board horizontally and vertically
- ▶ until that caregiver is able to make a direct eye contact with the patient through the selected cell.

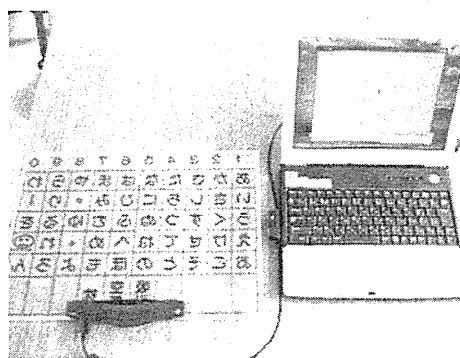


Eye-Link Communication Technique

- ▶ Merit
 - ◎ transparent board is inexpensive
 - ◎ this method is easy to do,
- ▶ Demerit
 - × it places stress on the caregiver
 - × the caregiver must duplicate two works:
 - he/she must read the letters indicated by the patient,
 - he/she must memorize or write them down so as not to forget them

Solution

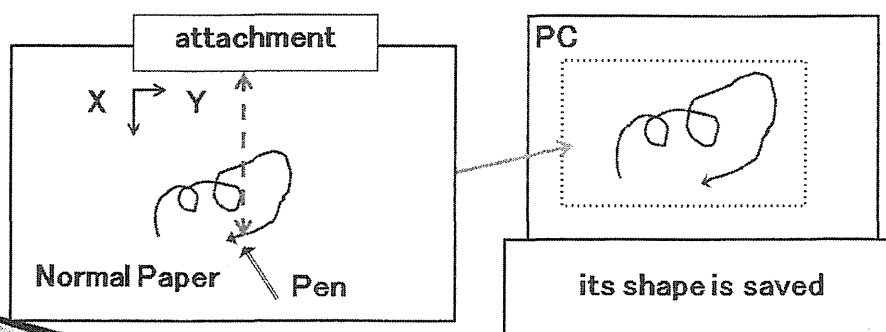
- ▶ To lessen these workloads on the caregiver,
- ▶ We develop a system that uses a commercially available digital pen in Eye-link communication.



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Solution

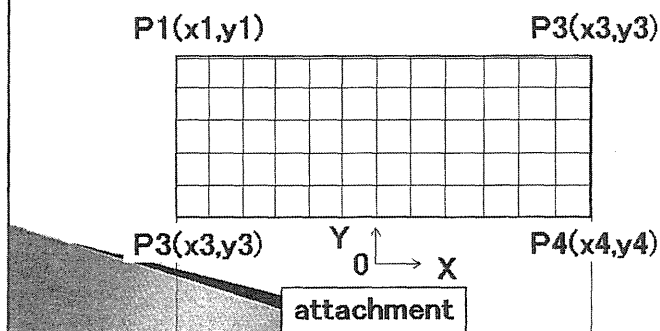
- ▶ A commercially available digital pen system can detect a relative position of the pen point to attachment center on 2 dimensional planes.
- ▶ When the user draw a picture, its shape is saved in the PC.
- ▶ I apply this digital pen to Eye-link communication.



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Solution

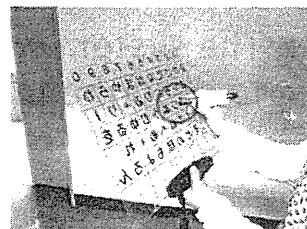
- ▶ A coordinate range of each letters on the board are previously calculated by registering
- ▶ a coordinate position of four corners of a board
- ▶ and an arrangement of a Kana board (column/row number, ordination of a letter).



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Solution

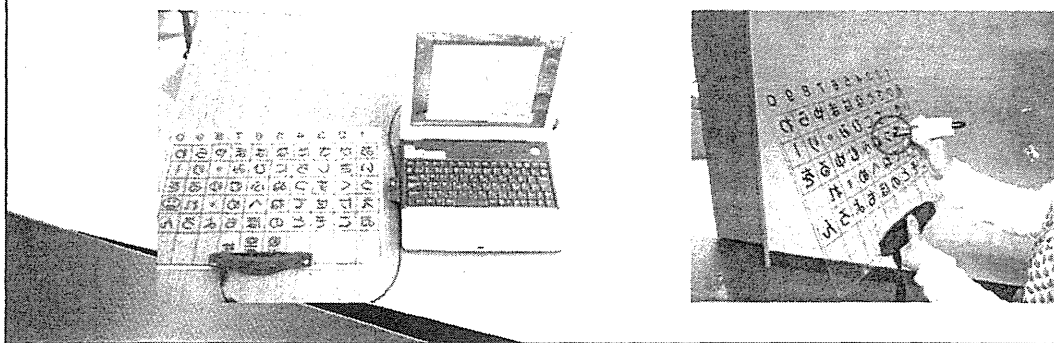
- ▶ A caregiver puts a pen point on the letter while reading a gazed letter on a transparent Kana board,
- ▶ and pushes a button as a trigger of a letter decision. (In the picture, caregiver moves pen point on "TSU")
- ▶ At this time a pen point position is acquired,
- ▶ and the letter corresponding to this position is saved in a word processing application.



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Solution

- ▶ As selected letters are automatically saved in a word processing application in the developed system, caregiver is able to concentrate to read gazed letters without memorizing and writing them down.
- ▶ The system aims to save indicated letters by the patient quickly in a word processing application. Saved letters can be copied to MS-Word application and kana-kanji conversion would be done later without hurry.



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Conclusion

- ▶ We had introduced this system to a hospital and other care affiliation.
- ▶ Many caregivers satisfy its usefulness in communication with patients.
- ▶ Especially they feel it is effective at the early stage that caregivers are not familiar with Eye-Link communication technique.
- ▶ We think it is not necessary to use this system when communication scene is a short content.
- ▶ The system will be effective when the patient wants to describe long sentence and the caregiver can't memorize these long sentence.

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Conclusion

- ▶ Now we can get one company's cooperation to realize this system commercially available.
- ▶ The product is called "Kokoro-touch" and commercially available inexpensively.
[http://www.hke.jp/products/kokorotouch/
index.htm](http://www.hke.jp/products/kokorotouch/index.htm)

