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المجلة ترحب بما يرد عليها من أبحاث وعلى استعداد لنشرها بعد التحكيم .
المجلة تحترم كل الاحترام آراء المحكمين وتعمل بمقتضاها .
كافة الآراء والأفكار المنشورة تعبر عن آراء أصحابها ولا تتحمل المجلة تبعاتها .
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البحوث المقدمة للنشر لا ترد لأصحابها نشرت أو لم تنشر .

بحوث العدد

الافتتاحية

من السمات الطيبة الحميدة التي يتميز بها مجتمعنا العربي عامة والليبي خاصة سمة التسامح والتكافل والتعاضد، متأثرين بأخلاق أجدادنا، متبعين لتعاليمَ حثنا عليها ديننا قال تعالى﴿وتعاونوا على البر والتقوى﴾ ولكن المجتمعات قد تعتريها الغفلة فيصيبها شيء من الخلل فتنقلب القيم والمفاهيم لديهم، تحل البغضاء محل الحب، والانتقام محل التسامح، فما أحوجنا اليوم أكثر من أي وقت مضى إلى التشبث بهذه الأخلاق النابعة من ديننا الإسلامي.

لقد تفشت وبشكل ملفت للنظر الكراهية والحقد بين أبناء المجتمع، وسرت في دمائهم النفعية الضيقة، والأنانية المقيتة، إن هذه الأخلاق السيئة ليست من سمات مجتمعنا، ولا من تعاليم ديننا، وإنها لمن عوامل الضعف قال تعالى:﴿ ولا تنازعوا فتفشلوا وتذهب ريحكم﴾ فالحب والوئام روح القوة والسمو، وهو جوهر الأخلاق والدين، والإنسان المتوازن نفسيا والمتشبع بتعاليم الدين كله تسامح وإحسان، فإن الإناء بما فيه ينضح، يحسن الظن بالآخرين، ويلتمس العذر للمخطئين .

وما الصراعات في المجتمعات الإسلامية عامة والليبي خاصة إلا نتاج هذه الكراهية المصنوعة، والبغض المبثوث، والتنافس غير الشريف، مما يجعلنا فريسة سهلة المنال للأعداء، انتشرت الكراهية حتى أصبحت الكلمات النابية والجارحة تتقاذف بين الناس، والأدهى والأمرّ أن تنتشر بين بعض طلبة أهل العلم، وعلى منابر العلم والمعرفة، وأصبح دم المسلم يراق صباحا ومساء، ليلا ونهارا، بذنب وبدون ذنب.

لقد تقدمت قضايا هامشية على حساب أخرى جوهرية مصيرية، فأين قضية فلسطين والقدس وما يفعله بأهلها اليهود أعداء الله مما يدور الآن، فعلى أهل العلم الفضل وبخاصة أساتذة الجامعات والباحثين أن يتقدموا الصفوف في الدعوة لنبذ الكراهية وإنعاش بذرة الخير في قلوب الناس، وتعزيز دعائم الحب والوئام .

هيئة التحرير

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Abstract

Single-key virtual scanning keyboard (VSK) is a very slow method used by individuals with severe disabilities or special needs for entering text and other data into computers and augmentative communication devices.Thesetechniques employing on-screen keyboardwith scanning and access switch as an alternative input device.The common Arabic on-screen layout is derived from the Arabic typewriter keyboard layout and not enhanced for command entry speed and has several problems. In this paper, we propose an alternative Arabic on-screen layout(non-QWERTY layout) and assess the performance and effectiveness of this innovative layout design for people with severe physical disability. The proposed layout was designed based on human-computer interactions and frequency-of-use for every user, employs block-row-item and row-item scanning techniques. A repeated experiment was performed to compare the speed and accuracy of text entry and communicationbetween the proposed method and the existing methods. Data's evaluation reveals that the designed method provided enhanced performance for the participant without increasing task difficulty. The performance enhancement of the suggested method is illustrated in the paper with user testing results.

Keywords: On-screen, virtual keyboards, assistive technology, augmentative communication aids, one-key scanning, scanning selection methods.

Introduction

The disabled people suffering from sever impairments such as quadriplegia, cerebral palsy, muscular dystrophy and the like, usually face difficulty in accessing computer-based systems.Most of the regular interaction modes are unavailable and their communication abilities are limited, since they cannot efficiently utilize normal computer access devices like mouse and keyboards. Therefore, Augmentative and Alternative Communication (AAC) provides alternative computer access keys or switches that require any active body of the user, including head, mouth, foot, or eye can be used to activate such a key.

The main goal of AAC systems is to improve the communicative capabilities of their users. To accomplish this, a number of aspects have to be considered in their development. [1] list the following:

1. Decrease of the physical input necessary to produce an utterance
2. Decrease of the cognitive load on the user
3. Increase the speed of communication
4. Decrease in delay between the users expressing what they want to say and the device uttering the proper words.

In many computer-based AAC systems these issues are addressed by two interrelated strategies: the first is to offer an effective item selection procedure,i.e. Virtual Scanning Keyboard (VSK) layout, which can be controlled by an access keys or switches. Here, scanning refers to the successive and periodic highlighting each of the items on the layout (characters/words/icons/phrases). When the highlighter reaches the wanted element, the user activates an access key to select that element. The other strategy tries to predict the element that the user intends to select. If the desired element is predicted properly, the user can simply confirm the suggestion and thereby saves effort and time [2].

For a user of a computer-based AAC system, performance depends on both the Virtual keyboard (VK) layout and the scanning method. Themain objective in the design of VSK is to reduce the motor requirements placed on the user and to provide the user with the fastest means of communication possible[3]. This is clearly an important goal, since the vast majority of users have severe motor impairments. However, a frequent consequence of reducing motor requirements is to increase the cognitive and perceptual loads on the user[4]. The net balance of this trade-off determines whether the user's overall performance will be improved or inhibited with a system [5].

This paper focuses on user performance with the common Arabic VSK layout in particular and suggestsenhancementson that layout using some of AAC techniques to improve the text entry efficiency of people with motor disabilities. The text entry efficiency is based on human-computer interactions (HCIs) and sustainability of the user model, employs row-item and group-row-item scanning techniques. The proposed method tries to enhance the user performance by modeling its intended users and adapting the system layout according to the user model. The system will provide the users with layout store rather than a single layout. Thus, different types of users will get different layouts suitable for them. Therefore, each user has got a layout that looks as if it is made only for him.

Layout Design

Virtual keyboard (VK)or on-screen keyboard layout is an efficient text entry to computer-based AAC system and very important variable in assisting disabled users to produce statements as easily and quickly as possible during conversation. VK is an accessibility utility refers to a software system displays an on-screen keyboard on the computer screen [5]. Typically, VK layouts display the standard QWERTY keyboard. Most of VK support point-and-click, and scanning input methods. Point-and-click access is suitable for people with limited movement who cannot reach across the standard keyboard, but can operate a pointing device such as a touch pad. For users with severe physical limitations who can physically control only one or a small number of muscle movements, single-key based scanning is the only viable control option[6].

Single-Key based scanning is typically used by people with severe physical impairments. The items are laid out spatially on the interface. Users make single item selections from the layout to compose a text. Figure 1 shows VSK in which a scanning is used to operate on common Arabic keyboard applied to the QWERTY layout. When the area containing the wanted item is highlighted, the user selects it by activating the access key. An access key is a specific intended hardware device that needs lesser motor control to function. Therefore, the rate of scanning is important, since the user has to push and release the key within the scanning delay for a highlighted region. Scan step delays in the studies range from 0.3 seconds to around five seconds [7].

Figure 1. Common Arabic VSK layout.

Regardless of the scanning delay, user performance depends on both the VK layout and the scanning technique. The standard Arabic keyboard layout is derived from the Arabic typewriter keyboards and applied to the QWERTY layout as shown in Figure 1. However, for people with severe motor disabilities,this layout is not optimized for performance. For instance, the left to right item scanning arrangement in figure 1 is slow. It requires about 33 scan steps to reach letter "ب". To address this, VSKs normally operate some type of multi-level, or divide-and-conquer, scanning. In this case,scanning continues row to row. When the row including the wanted character is highlighted, it is selected. Scanning next enters the row and proceeds left to right within the row. When the wanted item is highlighted, it is selected. Clearly, this is an improvement.The letter "ب" for example, is selected in 8 scan steps i.e.3 row scans + 5item scans. The technique one of the several methods used to operate VSKs. Some of these methods are discussednext.

Key-based selection techniques

Key-based scanning selection is a technique used by individuals with severe physical impairments for entering text and other data into computer-based AAC systems. It is an important method because it can be used with as little as one switch for input. A common implementation of key-based selectiontechnique is to combine a VSK layout with a single key, button, or switch for input [2]. To clarify more, the screen is assumed to represent a two-dimensional matrix of letters, numbers, symbols, words, or phrases. The items that are present on the screen are individual cells of the matrix which are sequentially highlighted, or scanned. Scanning is normally automatic, managed by a software timer, but manual scanning is also possible. In this case, the highlighted region is advanced as activated by the user action [8].

The most general form of matrix scanning is a three-level scan, often called the block–row–item scan [8]. In a block–row–item scan, the matrix items are grouped into blocks. Each block comprises of a set of rows of items. The system firstly begins a block level scan. During this process, the block that contains the desired item is selected by the user. When a block is selected, the system starts a row-level scan inside the block. During the row level scanning, the row in which the desired item lies is selected. And then the items of the selected row are scanned. Once the scanning reaches the wanted item, the item is selected. A variation of block–row–item scan is the diagonal selection mode. In this technique, a block is split into two triangular matrices based on the main diagonal. In the first stage of the scanning, the two parts of the matrix are periodically highlighted, and the user selects the triangle where the target item is located. Then a row scanning is applied for its rows and so on. Other two variants of the block–row–item scanning are the row–item scanning and the item scanning explained earlier.

To improve performance of a scanning based interaction, several methods have been studied. These methods include the use of different letter adaptations, word or phrase prediction, and adjusting the scanning interval. The most obvious improvement for row-item scanning is to dynamically adapting items by placing frequent items close to the beginning of the scan sequence, such as in the initial row or in the first arrangement in a column[9] and [10].

Resent researches on performance improvement of VSK concentrates on matrix scanning using a three-level or higher selection scheme, known as quadrant scanning[11],[12], and [13]. The idea is to sweep or scan through a group of items. The first selection enters a group. Scanning then continues among smaller groups within the selected group. The second choice enters one of the smaller groups, and the third choice selects an item within that group. There is a trade-off among the number of levels to travel across and the number of items to pass over in each level. Group scanning is most applicable to allow access to a large number of items [14].

Scanning and switch based access methods are generally much slower than mouse/keyboard based methods. To enhance performancein scanning based interactions, many alternate scanning mechanisms along with many techniques have been developed. In this paper, the proposed method tries to enhance the user performance by modeling its intended users and adapting the system layout according to the user model.The proposed model does not center on a specific application. It combines user usage logging and grouping for deriving adaptive actions. The model is active in nature and becomes more personalized with more usage.However, the performance improvement techniques suffer from some serious limitations. These limitations along with our solutions to overcome them are discussed next.

User modelling

It has been investigated that user is the most important variable in HCI design. Research in HCI has shown for a long time that the design of user interface is the crucial factor for the resulting performance of the user. The user poses a great challenge to the HCI designer because of a large variety of user profiles based on task, condition and user characteristics[15]. Thus, HUI centers on understanding users. User model is the clear assumption about the knowledge and mentality of the user. It can be defined as a representation of the knowledge and preferences which the system 'believes' that the user possessed [16]. For an improved HCI, a user model has to correctly evaluate the type of the user before initialization of the interface and getting adapted to the user during the course of interaction.

To improve performance of anAAC user interaction, a lot of researches have been done on user modeling for several adaptable applications. These models can be depicted as a generic structure (Figure 2). In [17], fuzzy logic is used to categorize users of an intelligent teaching system. The fuzzy groups are used to derive certain characteristic of the user and thus predicting new rules for each sort of users.

Lumiere[18],convenience project of ASC group of Microsoft research established alternative probabilistic model, viz. effect diagram in modeling users. Lumiere project is the background theory of the Office Assistant shipped with Microsoft Office application. The influence diagram indicates the relationships between user's severe needs, objectives, user background etc.

When the users are disabled or not normal users, the design of user model becomes more difficult. Some implicit assumption in case of normal users has to be taken explicitly for disabled users. As for instance the intellectual level of able-bodied users is assumed in accordance to their age, but it is not true for mentally retarded users. AVANTI [19]project offers a user model for unable-bodied users. The objective of this project is to address the interaction wants of disabled people using web-based multimedia applications.

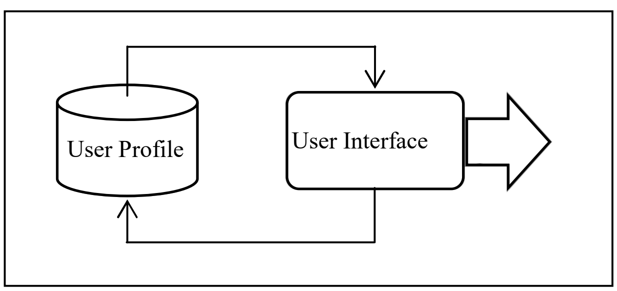


Figure 2 Application Particular User Models

The typical characteristic of the user interface in AVANTI is its ability to dynamically adjust itself to the abilities, skills, wants and favorites of the users, to the different contexts of use, as well as to the altering characteristics of users, while interacting with the system. The sorts of disabled users supported in the current version of the system are: blind people, and severe motor disabilities. The user model is based on dynamic and static characteristics of users. The user interface of AVANTI project first initialized based on some static characteristics of the user. After getting started the layout keeps changing its actions depending on some dynamic characteristics of the user. However, studies like [13] rejected this kind of dynamic rearrangement scheme, claiming that the constantly changing display would require an excessive degree of concentration by the user. The necessity to search the dynamic matrix after each character may imply that the scanning delays and switch closure times must increase to maintain a constant accuracy, thereby offsetting the decrease in switch counts and yielding small or negative time savings [20]. Additionally, users suffering from visual disabilities have trouble getting used to the quick dynamic rearrangement of the items. They preferthe static scan instead.

Proposed improvements

OUR USER MODELING APPROACH

The suggested user model does not focus on a particular application. It enhances user usage logging for deriving adaptive actions for next interactions. The model is dynamic in nature and becomes more personalized with more usage. The novelty of the user model can be summarized in the following:

- The model is not a static one and it will be frequently updated. Thus, enhanced personalization will be provided with more usage.
- Absence of information will not be a problem for initial user profile creation. The relationship between the user characteristics can be used for predicting unpredictable attribute values.

- In the model, users are grouped according to their characteristics. The amount of clusters can be controlled. Hence the model is easily scalable for a large number of users.

Despite the user diversities in terms of physical and mental abilities, the proposed user model aims to model disable users to provide them a personalized layout. The main requirements from a user model for disabled user can be expressed as follows:

- Suitable categorization of users
- Providing an proper layout to a user
- Tracking user's actions with the layout
- Updating user profile

After the requirements from a user model, the user model for the present work is created with respect to our system using the following steps

1. **Choosing user characteristics:**At any disability care center, a patient is described by a set of characteristics. These characteristics are measured by a group of specialists including language therapist, speech pathologists, social supporter, physician etc. They gather a lot of user characteristics before taking a treatment decision. In this stage the characteristics, that have to be considered for the current application, will be identified. A list of those attributes is presented in[15]. Among these attributes a set of characteristics will be selected which can be used to provide a better HCI.
2. **Gathering data:** This step deals with collecting data from users about the characteristics selected in preceding step through a user evaluation sheet. The initial user data was conducted using 20 subjects with no cognitive impairments and who are native speakers of Arabic language. During selection of subjects, main emphasis was given on getting as much diversity as possible, the variety of the selected subjects according to age, computer proficiency, and education background.

3. **Gathering users**: In case of the number of users is big, it may not be possible to store details of each individual user. To make the system scalable, the users will be grouped in small number of clusters and the system will store detail about each group. In real live implementation most of the users are under treatment and therefore some of their attributes are not stay static. There could be chance that some user belongs to more than one group. Thus, fuzzy c-means clustering algorithm [21] is being chosen as a metric for cluster validation.
4. **Finding relation between the attributes**: In this step we will find if there exists any relationship between two or more attributes. If two attributes are related to each other, then value of one attribute can be predicted by getting the value of another attribute from the cluster center. It has been found that all the characteristics are not independent of each other. As for instance language level is very much dependent on the education level. The scanning properties are dependent on oculomotor characteristics of a user.
5. **Usage logging**: In this step, the usage pattern will be stored for adapting the model with individual users. The usage logging is used to keep all the user actions during the interaction. For the present system, we have defined a number of high level events. The general log file saves events (the most frequently used characters, most frequently used words for the user, scan and delay etc…), in the following format. <Event id, event name, input text, timestamp>. This format was selected based on our requirements analysis and it can easily be converted to any existing log format[22].
6. **Adapting the knowledge base**: in final step, the user model will be updated to cope with the changes in user profile and interaction patterns. There are two methods of updating the knowledge base

- Taking input from the users or their instructors.
- Examining the log file after each interaction.

User characteristics like age, language level, and education level are periodically updated taking explicit user input. The log file entries illustrate different dynamic user characteristics. Based on these dynamic user characteristics, the preferred run time actions like providing suggestion, for particular users are identified. The user model to be used in the next interaction memorizes these preferred actions (more details about the user model and related works can be found in [15].

LAYOUT ADAPTATION

Our layout personalization method can be outlined in the next six stages

1. Identifying a generic layout construction.
2. Constructing varies layouts from the generic layout construction to create a layout store.
3. Adapting each layout of the layout store according to user model using the following stages.
   a. Defining layout components to be adapted.
   b. Selecting a group of characteristics for each component.
   c. Adapting property values in relation to the user model.
4. Adapting the layout according to the users' profile for next use.

The first 3 stages provide static adaptation viz. adaptation that is provided before start of interaction and remains static during the interaction. The fourth stage takes care of following user interaction pattern and giving more personalized look to the layout for the next use. In the current system initially we define a generallayout structure. From thatstructure, we defined two kinds of layouts based on selection technique and language representation mode (how the selections create communication).

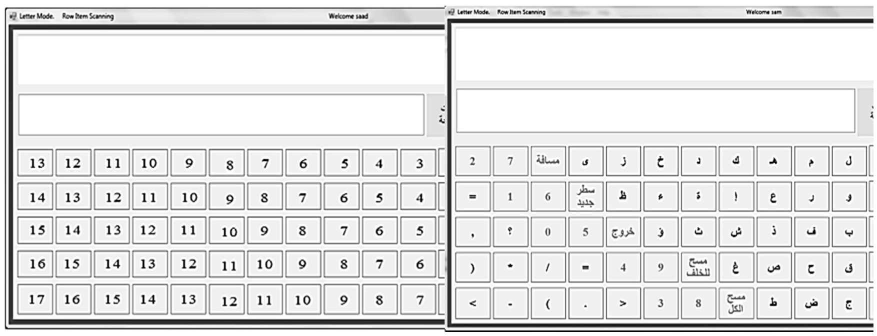
Iconic communication mode: Users, who do not have the enough knowledge to spell a word and cannot understand a word by only reading it, can use the Iconic. This interface will be initialized based on the user model. This interface will give Icons and their textual explanation. The user can compose a sentence by selecting a proper sequence of icons.

Letter communication mode:in this mode a VSK layout with word prediction facilities for advanced users. The user has to spelleach word to generatetext.

The user interaction on each mode layout is based on scanning techniques. In our system we employed two scanning methods i.e. row-item scanning and block-row item-scanning.

Apart from such augmentation, the goal is usually to reduce the total number of scan steps to reach the desired item on the layout. In this paper, the focus mainly on the concept of the adaptation and quadrant scanning mechanisms, because only requires one user input selection. In the proposed method to improve user performance, rather than dynamically adapting the items after each item selection, fixed character layouts are chosen. However, During the initial assessment of each user the default layout arranged based on the user model and most frequency in Arabic language, which each item has high frequent of use takes place has low scanning steps as shown in Figure 3.

The layout captures each user action and records them in a user profile. The user profile personalization is updated remains indifferent towards a user for his distinctive interaction patterns at a different context and time. When the user exits the system the fine-tuned form of the layout and the user records are stored for modification of the existing knowledge base. Based on this knowledge, when the user logs into the system again, the system will provide the user an appropriate interface and all new configuration changes made by the user will be automatically saved for later use and so on.



(a) (b)

Figure 3. (a) Numbers denotes to scan steps to select this item (b) Default VSK layout design.

In the proposed framework, the user profile is used to predict a proper VSK layout from the knowledge captured for that user. In that predicted interface, the interface components will be adapted according to each individual user. So user will get a taste of personalization before starting interaction. The speed and accuracy of the scanning mechanism are increased with the help of adapting of the items based on the user profile captured, and the scanning mechanism selected.

Experiments and performance evaluation

The study was conducted using 20 subjects with no cognitive impairments and who are native speakers of Arabic language. The main focus was on measuring the performance of the proposed method. A number of well-known measures have been used including text-entry rate, communication rate. The usability evaluation and analyses were carried to compare the performance with Arabic VSK built in Microsoft Windows 7. The performance measuring technique is illustrated in the next section and the analysis results for each type of layout is explained and clarified.

SCAN STEPS PER CHARACTER SSC

Scan steps per character is presented here as a characteristic measure for VSKs. It is the number of scan steps, on average, to enter a character of text using a given scanning keyboard in a given language. The average of SSC can be calculated by:

$$\mathrm{SSC} = \frac{\sum \mathrm{totalScanSteps(S)}}{\sum_{S\epsilon corpus} \mathrm{totalNumSentences(N)}} \quad (1)$$

Where, $\mathrm{totalScanSteps(N)}$ is the total of scan steps sequence needed to type a message S, and $\mathrm{totalNumSentences(N)}$ is the total number of sentences in the corpus (in letters).

TEXT ENTRY SPEED

An advantage of SSC is that, it directly produces text entry speed, T_{entry}, inwords per minute (WPM), assumed a scanning delay D in milliseconds then:

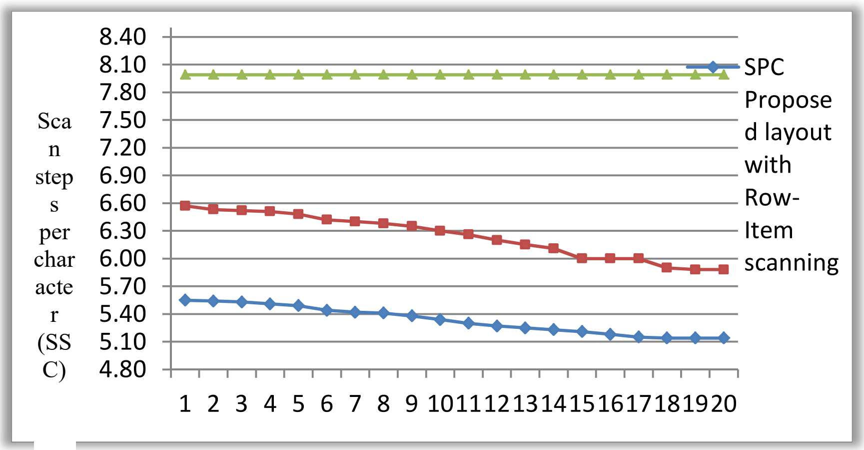
$$T_{entry} = \left(\frac{1}{SSC}\right) \times \left(\frac{1000}{D}\right) \times \left(\frac{60}{5}\right) \quad (2)$$

Where, the first term $1/SSC$ changes SSC into characters per scan step. Multiplying by the second term $1000/500$ produces characters per second and by the third term yields WPM. For instance, if the D is, say 500 MS, and SSC = 3.66 ssc, then,

$$T_{entry} = \left(\frac{1}{3.66}\right) \times \left(\frac{1000}{500}\right) \times \left(\frac{60}{5}\right) = 6.56 \text{ wpm} \quad (3)$$

Generally, WPM is typically calculated to report the speed of a text entry method in similar researches. The standard definition for "word" is a term of 5 letters, including space[23]. However, in our case, it's not reliable if we concentrate on WPM as the total of letters per word of syllabic script and that of alphabetic language might not be the same. We hesitate to measure 5 letters per Arabic word as there is no exact source. Therefore, we based on characters per minute (CPM) to evaluate the performance of the proposed method. Herein, we calculate CPM by dividing the written text which contains of 165 characters (in the trials) with the completion SSC of each experiment.

We have three clusters of subjects: first cluster refers to the subject that experiences proposed method with row-item scanning (5 users). Second cluster is the subject that has experience proposed method with block-row-item scanning (5 users). The third cluster consists of 5 subjects who have basic knowledge of QWERTY layout of block scanning built in windows 7. Subjects were presented with 20 target sentences. The same set of 165 letters was used in each trial, but the order was randomized.



Trials

Figure 4. Variation of SSC for the 3 subjects using proposed method and the QWERTY layout of block scanning built in Microsoft Windows 7.

Figure 4 shows SSC of these three clusters. For initial cluster at the first trial, scan steps was 5.55 SSC. The second group subject started with 6.57 SSC. In both groups, the scan steps of this method gradually decrease while the subject continues using the same log file. This decline continues until it reaches a point where all the items frequent and likely to appear in the text arranged in the places near the beginning of the scan sequence. The third cluster subject started with 7.99, and it is constant in all sessions.

As the figure 4 shows, SSC of the proposed methods is lesser in each trial in comparison to that of the existent one. We observe that the graph of the first cluster subject and that of the second cluster subject yield similar trend that SSC of the proposed method is lower than that of the existing method. This is telling us that our method yield better speed since the subjects that have the same experience of both methods could go faster with our proposed method even at the first time. Moreover, we observed that, as the user continues using the system (i.e. for longer usage), the ratio of the number of inputs to number of words decreases. So that effort from users' side will not decrease remarkably with long usage of the system.

Conclusion

Single-key VSKs is a very slow technique used by persons with severe impairments for entering text and other data into computers and AAC systems. This paper has presentedenhancements to the layout of Arabic VSK for AAC users. The enhancements based firstly on user model and HCI stored on a user profile. The user profile is used to predict a suitable layout from the knowledge captured for that user. In that predicted layout, the interface components will be customized according to each individual user based on his model and profile. Thus, user will get a flavour of personalization before beginning interaction. The speed and accuracy of the scanning mechanism are improved with the help of rearranging of the matrix items based on the knowledge captured, and the scanning mechanism selected.

We have conducted two aspects of user assessment i.e. scan steps per character and text entry speed. The design of the metrics and methods used to evaluate the proposed method influenced by the work[15], and [24]. The assessment shows that, the proposed method worked more effectively and offers much more flexibility in terms of versatility layouts and features than existing one. Future study that validates the effectiveness of other aspects for people with motor disabilities is needed. Rate of entry is not the only standard for an effective input system. We have to take into account other problems such as easy learning, low error ratios and ease of error correction. The time spent on fixing typing errors has a main impact on text entry efficiency.

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الفهرس

يشترط في البحوث العلمية المقدمة للنشر أن يراعى فيها ما يأتي :

- أصول البحث العلمي وقواعده .
- ألا تكون المادة العلمية قد سبق نشرها أو كانت جزءا من رسالة علمية .
- يرفق بالبحث المكتوب باللغة العربية بملخص باللغة الإنجليزية ، والبحث المكتوب بلغة أجنبية مرخصا باللغة العربية .
- يرفق بالبحث تزكية لغوية وفق أنموذج معد .
- تعدل البحوث المقبولة وتصحح وفق ما يراه المحكمون .
- التزام الباحث بالضوابط التي وضعتها المجلة من عدد الصفحات ، ونوع الخط ورقمه ، والفترات الزمنية الممنوحة للعديل ، وما يستجد من ضوابط تضعها المجلة مستقبلا .

تنبيهات :

- للمجلة الحق في تعديل البحث أو طلب تعديله أو رفضه .
- يخضع البحث في النشر لأوليات المجلة وسياستها .
- البحوث المنشورة تعبر عن وجهة نظر أصحابها ، ولا تعبر عن وجهة نظر المجلة .

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