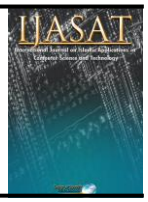

"ENNOUR" To search, interpret and translate verses of the Holy Quran including recitation

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Abstract
This program is called "ENNOUR", one of the names of the Holy Quran. It aims to conduct research on the Holy Quran and learn the pronunciation of the Quranic verses. Moreover, it offers interpretations (explanations) of the verses and also provides their translations in English and French. It is available in five versions: version without recitation, three versions with recitation by a particular reciter who may be Saad El-Ghamidi, Mishari Bin Rashid El Afassi or Abu Bakr El Shatiri and the fifth version with recitation by all the reciters mentioned before. This tool offers the following main tasks: Display all the Holy Quran, display a specific surah of the Holy Quran, display the whole Holy Quran with explanations, choice of display pattern, choice of font size, explanation of a specific verse (in Arabic), translation of a specific verse to English and French, search for words (whole word or just a substring of the word on the entire Holy Quran or in only one part), search for phrases (whole phrase or just a part of the phrase on the entire Holy Quran or in only one part), printing searched results. In versions with recitation: recitation of a chosen surah or the looped recitation of the whole Holy Quran, recitation with synchronization of text and speech, increase or decrease volume. Here is the link for downloading this program: https://sites.google.com/a/esi.dz/ennour/.

Keywords: Holy Quran, Recitation, Quran Search, Quran Interpretation, Quran Translation.

1. Introduction

Since the advent of computers, many programs have been dedicated to the Holy Quran. These programs have been developed on all platforms: Windows, Linux, IOS, Iphone, Android, etc. Most of these programs had several objectives including the main ones: learn to read, learn to pronounce, learn the meaning of the verses, learn to memorize, search for words or phrases.
Some programs are only devoted to reading Holy Quran and are characterized by reading rules. The Holy Quran book software [1] is a good example. Other programs are fully featured with advanced searching, navigation and recitation. We can cite Zekr software [2]. There are programs which are more oriented towards translation such as Al Quraan software [3] which offers translations to 80 languages. We also find programs allowing which explore studying of the Holy Quran in depth. The Al-Quran Explorer software [4] is a good reference since it provides the explanation of the all verses. Another category of programs deals with memorization of the Holy Quran. In [5] there are advanced tools that make the Holy Quran

memorization easy and effective. In [6] the recitation can be performed word by word. A click on any word or verse allows us to hear the proper recitation.

We introduce in this paper a 100% Arabic environment to conduct research on the Holy Quran and to learn the pronunciation of the Quranic verses. Moreover, it offers interpretations of the verses and also provides their translations in English and French. Currently, the platform runs on Windows systems. The proposed interface is unique. All the features of the application are accessible by simple mouse clicks. The foreground windows for translation and explanation never appear above the Quran. It's the same for the multimedia window. Only the results window can be in the foreground as it holds verses of Holy Quran.

The paper is organized as follows: Section 2 gives the interface of ENNOUR environment. It describes in particular the display modes with the different patterns. Section 3 presents the basic features of ENNOUR which are searching in the Holy Quran and recitation. Other features are presented in section 4. Section 5 shows how to use the application. In section 6, we give some implementation details and security measures to protect the application. Finally, section 7 concludes the paper.

2. Interface of ENNOUR environment

The interface of ENNOUR environment is the main window containing the Holy Quran around which buttons gravitate. Figure 1 shows this interface. The buttons represent the features of the application. These features are divided into two categories: display and actions. There are three display modes. The actions are many and involve searching, recitation, explanation and translation. We describe below the display modes. The main actions are presented in the next sections.

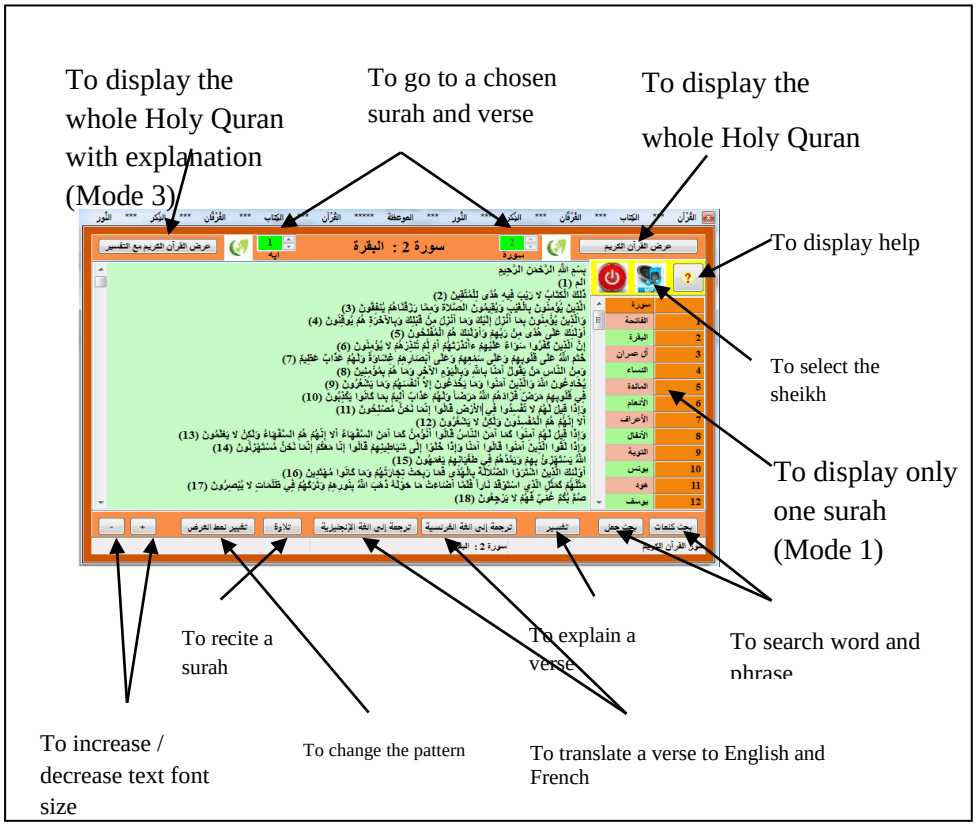

Figure 1. XML version of one page of Riyad book extracted from its EPUB version.

2.1 Display modes

Three display modes are possible. For each mode, there is one or several display patterns.

(1) The 'surah by surah' display mode.

The right array of surah names in the application interface allows to access directly to a specific surah. It's the default mode. There are two patterns in this mode. For the first pattern each verse is written in a new line and for the other pattern the verses are written in the same line as this is shown in figure 2.

Figure 2. The two patterns of the 'surah by surah' display mode

(2) The 'All surahs' display mode. This is the عرض القرآن الكريم button. All the Holy Quran is displayed. There are three patterns which are depicted in Figure 3.

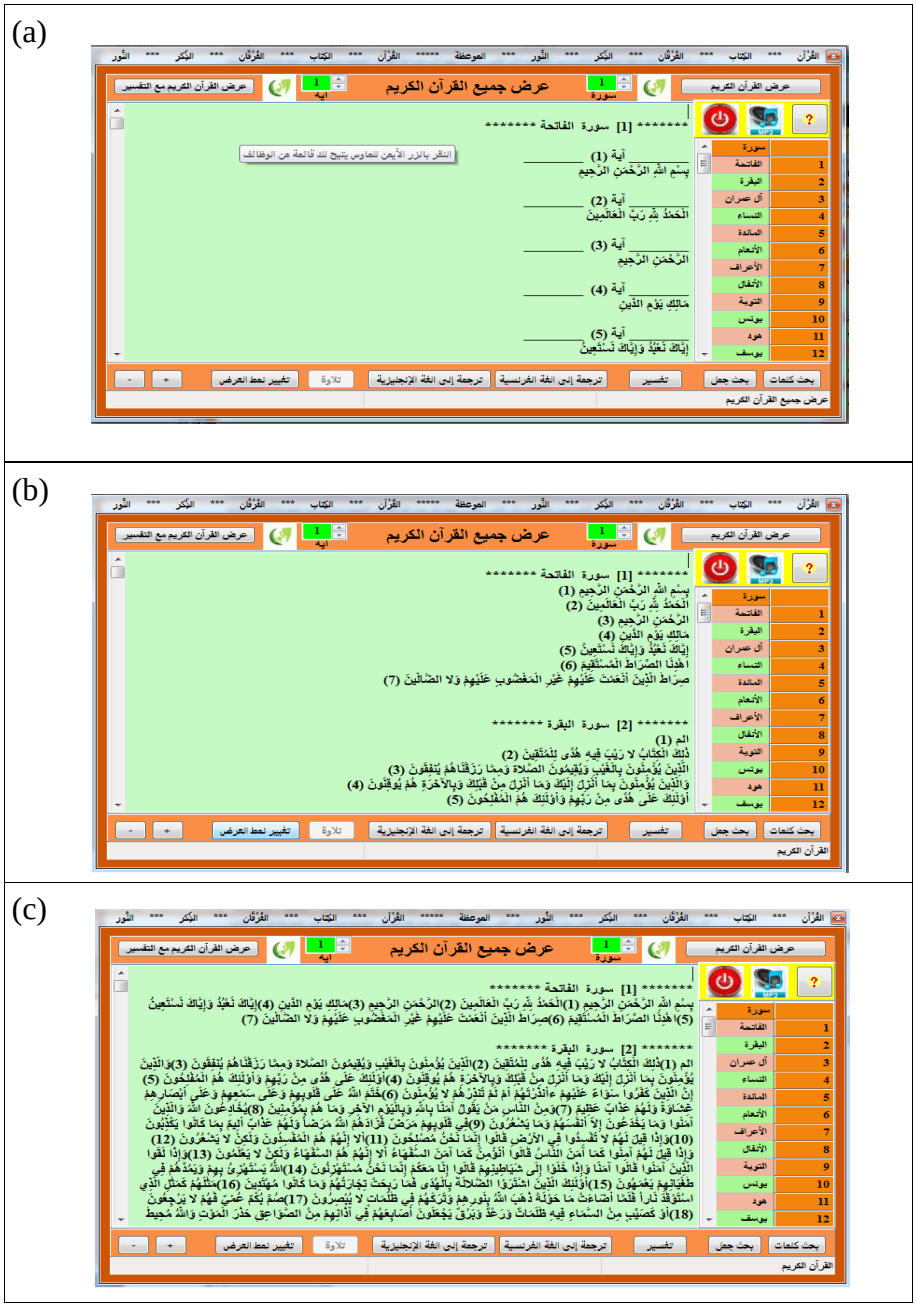

Figure 3. The three patterns of the 'All surahs' display mode

(3) The 'All surahs with explanation' display mode.

This is the عرض القرآن الكريم مع التفسير button. All the Holy Quran is displayed with the explanations of all the verses. There is only one pattern. Each verse is followed by its explanation as shown in Figure4.

Figure 4. The 'All surahs with explanation' display mode

For each display mode, it is possible to move to any verse of any surah. These are the two buttons at the top of the application window.

3. Basic features

3.1 Searching

Searching is possible on the Holy Quran. There are two types of searching: searching by word and searching by phrase. Figure 5 shows the interface allowing to introduce searching parameters in the case of a word searching.

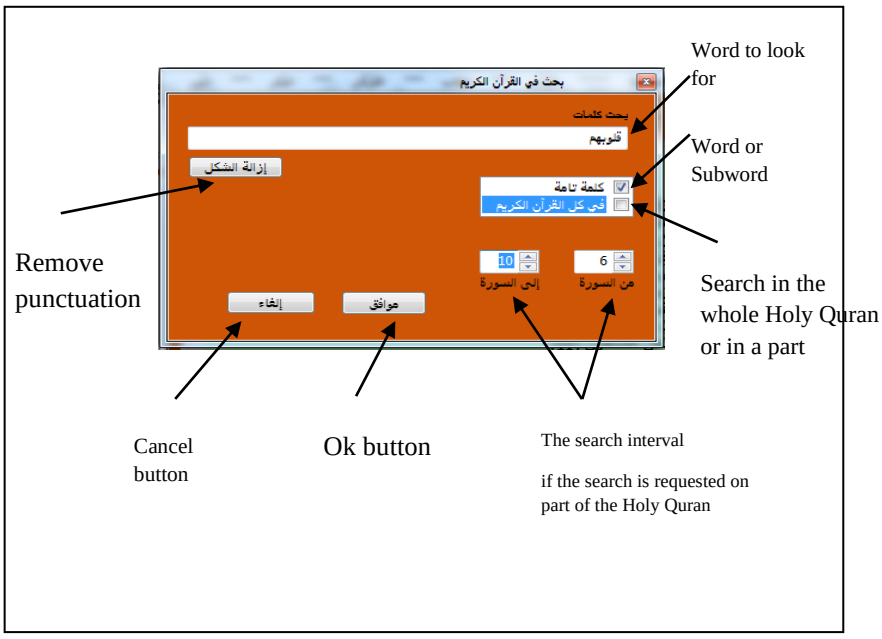

Figure 5. ENNOUR search interface

3.1.1 Word searching

In our context, word means several consecutive letters different from the space character. We can search for words or subwords. The scope of the search is limited to one surah or an interval of surahs that can cover the entire Holy Quran. The searched words or subwords can be punctuated or not. The search can also be done on a set of words. In this case, it is a logical OR.

Figure 6 shows the search result of word مُسْلِمُونَ . This word occurs 14 times in 14 verses in 8 surahs. The foreground window shows the results of the searching in a text editor. The searched word is in red. The results of the search are displayed by group. The scroll bar allows browsing the group. Groups are loaded using the next and previous buttons in the results window. The results can be enlarged and printed.

Figure 6 Result window for searching for the word "مسلمون"

Figure 7 shows the search results of subword ربّكwithout punctuation. This word occurs 395 times in 375 verses in 72 surahs. Results are shown in the foreground window.

Figure 7 Result window for searching the subword ربّك

3.1.2 Phrase searching

In our context, phrase means several consecutive words.

Similarly, we can search for phrases or subphrases. The scope of the search is also limited to a surah or an interval of surahs. The searched phrases or subphrases can be punctuated or not. Figure 8 shows the search results of phrase إِنَّ اللَّهَ عَلَى كُلِّ شَيْءٍ قَدِيرٌ. This phrase occurs 8 times in 8 verses in 6 surahs. The foreground window shows the results.

Figure 8. Result window for the search of phrase إِنَّ اللَّهَ عَلَى كُلِّ شَيْءٍ قَدِيرٌ

3.2 Recitation

Recitation is only possible in mode 1 with the two patterns previously described. The table of names of verses located on the right of the application interface allows to select the surah to recite. Three sheikhs were considered in our application: Saad El-Ghamidi, Mishari Bin Rashid El Afassi and Abu Bakr El Shatiri. A menu exists to select a sheikh. Thanks to the integrated media player in our application, we can:

- recite a chosen surah,
- recite the whole Holy Quran in a loop,
- increase or decrease the volume,
- stop the recitation momentarily,
- stop the recitation definitely,
- repeat the recitation,
- move forward or backward several verses. Just move the scroll bar forward or backward.

Figure 9 shows the interface of the media player while verse 11 (highlighted text) of surah 41 is playing.

Figure 9. Media player interface

4. Other features

Our application also allows performing the following functions:

- Explanation of verses in Arabic.
- Translation of verses in English and French.

To perform a function double-clicks on the number of the verse and press the button of the appropriate function.
The search results can be printed. Statistics are first displayed followed by all the verses. Figure 10 shows an example of a printed page.
The application is available in five versions:
- One version without recitation.
- Three versions with recitation by a particular reciter who may be Saad El-Ghamidi, Mishari Bin Rashid El Afassi or Abu Bakr El Shatiri.
- One version with recitation by all the reciters mentioned above.

The program can be used without the use of keyboard, i.e. just with a mouse clicks.
While listening, it is possible to search for words or phrases as it is also possible to ask for interpretation or translation of the verses in English and French.

Figure 10. An example of a printed page

5. Application use purposes

The developed application can be used for several purposes:
- Reading the Holy Quran.

With a simple mouse click a surah is loaded in the main window. The text can be enlarged to see the writing and the punctuation well.

- Listening the Holy Quran.
Similarly, any surah can be loaded to be listened by an integrated media player. This one offers all the features to increase or decrease the volume of the sound and to go to any verse of the surah. Thanks to the synchronization of the text with the recitation, any person will be able to learn pronouncing verses of the Holy Quran.
- Research on the Holy Quran.
A personalized study can be undertaken on the Holy Quran by searching for words, subwords, phrases and subphrases.
- Comprehension of the Holy Quran
Any verse of any surah can be instantly loaded to see its explanation in Arabic.
- Translation to English and French
While being in any pattern of any mode, a translation of a verse to English or French may be requested.

6. Some implementation and security details

The IDE lazarus [7] has been used with Free Pascal to develop the application.
All the Holy Quran is loaded into RAM in a 3-level linked list structure. Technically, it's a linked list of linked list of linked list of words. The first list is dedicated to surahs. Each element of the first list points to a second list dedicated to verses. Finally, each element of the second list points to a third list containing the words associated with a verse. All display and search functions work on these lists.
The synchronization of the recitation with the Quranic text is accomplished thanks to files constructed beforehand containing the time consumed by each verse. There is one file by reciter (Sheikh).
To verify data integrity, a generator of fingerprints was used to crypt as well the data files as MP3 files. Inside our program, these fingerprints are recalculated to check the authenticity of the files.
Also, to verify that the supplied Zip files for download are ours and that they have not been modified, we have provided the users of our program with the fingerprints of each Zip file. In this way, users will be able to recalculate these fingerprints to ensure their authenticity.
MD5 program [8] is used inside our application and SHA256SUM program [9] is used for Zip files.

7. Conclusion

We think ENNOUR is a good environment to serve the Holy Quran. We also think that the aimed software will be of a great interest to read and listen to the Holy Quran. Thanks to its search engine, it allows to make simple searching or study in depth the secrets of the Holy Quran. One of the strengths of our application is that it allows the synchronization of the text with the recitation. Moreover, while listening, it is possible to search for words or phrases and to ask for interpretation or translation of the verses to English and French. Finally, we thought about conceiving others applications with the same interface oriented towards learning to read and memorize the Holy Quran.

8. References

[1] https://holy-quran-book-for-windows.en.softonic.com
[2] http://zekr.org/quran/en/quran-for-windows
[3] https://alquraan.en.softonic.com
[4] https://al-quran-explorer.en.softonic.com
[5] http://www.houseofquran.com
[6] http://www.houseofquran.com/qsys/quranteacher1.html

[7] https://www.lazarus-ide.org
[8] https://en.wikipedia.org/wiki/MD5
[9] https://en.bitcoin.it/wiki/SHA-256

Biodata

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