

## Related Work :

In recent decades, many pattern matching algorithms have been developed and improved to meet the needs of various applications . Some of these algorithms, as previously described, used a single sliding window to search the text for a specific pattern, while others used two or more sliding windows. On the other hand, some of these algorithms require two phases, pre-processing phase to calculate shift values and searching phase. The shift values also varies from one algorithm to another, for example; the shifting values in the BoyerMoore algorithm (BM) in case of a mismatch (or a complete match of the whole pattern) depends on two pre-computed functions to shift the window to the right the good-suffix shift and the bad-character shift. The pre-processing and searching time complexities of (BM) are  $O(m + |\Sigma|)$  and  $\Omega(n/m), O(n)$ .

Berry-Ravindran algorithm (BR) depend on the bad character shift function to determine the shift value in case of a mismatch and the searching phase make use of one sliding window from left to the right. The pre-processing and searching time complexities of BR algorithm are  $O(\sigma^2)$  and  $O(nm)$  respectively.

Two Sliding Window algorithm TSW enhanced (BR) by using two sliding windows instead of one, each of them equal to the length of the pattern  $n$ . One window aligned with the text from the left the other from the right and the both windows shifted according to bad character shift. In TSW, the best, worst and pre-process time complexity are  $O(m)$ ,  $O(((n/2-m+1))(m))$  and  $O(2(m-1))$  respectively .

In order to minimize the number of comparisons, Enhanced Two Sliding Window algorithm (ETSW) made some modification on TSW. the modifications happened on the comparison process by using two pointers one from the left of the pattern and the other form the right of the same pattern. The same process applied to the two windows, the best, worst and pre-process time complexity are  $O(m/2)$ ,  $O(((n/2-m/2+1))(m/2))$  and  $O(2(m-1))$  respectively .

ERS-A uses two sliding windows the same as used in TSW. In addition to using (RS-A) algorithm to calculate the shift values of the right pattern, some enhancement to calculate the shifting values for the left pattern was done to maximizes the efficiency of the searching process with  $O([n/(2*(m+4))])$  time complexity in average case.

The Intelligent Predictive String Search Algorithm, that we're going to develop in several stages have the following properties:

- It does not require pre-processing phase.
- It finds the first occurrence of a pattern in a text that consists of words separated by a blank space.
- It makes use of one sliding window to search the text from left
- It uses two rules to make a shift namely alphabet-blank mismatch and alphabet-alphabet mismatch.

We are going to explain the algorithm in detail in the next section.