ISTANBUL TECHNICAL UNIVERSITY
FACULTY OF COMPUTER AND INFORMATICS

Project Title

Graduation Project

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Özgünlük Bildirisi

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Besim Ongun Kanat

Acknowledgments

Project Title

(SUMMARY)

Proje Başlığı

(ÖZET)

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1 Introduction

In November 1936 Alan Turing published his groundbreaking paper which creates foundations of computer science [1]. It was the Big-Bang of the computer science that created a new universe from dusty works of his ancestors.

2 Project Description and Plan

This is the best graduation project ever. In Figure 2.1 you can see the Gantt diagram of the project.

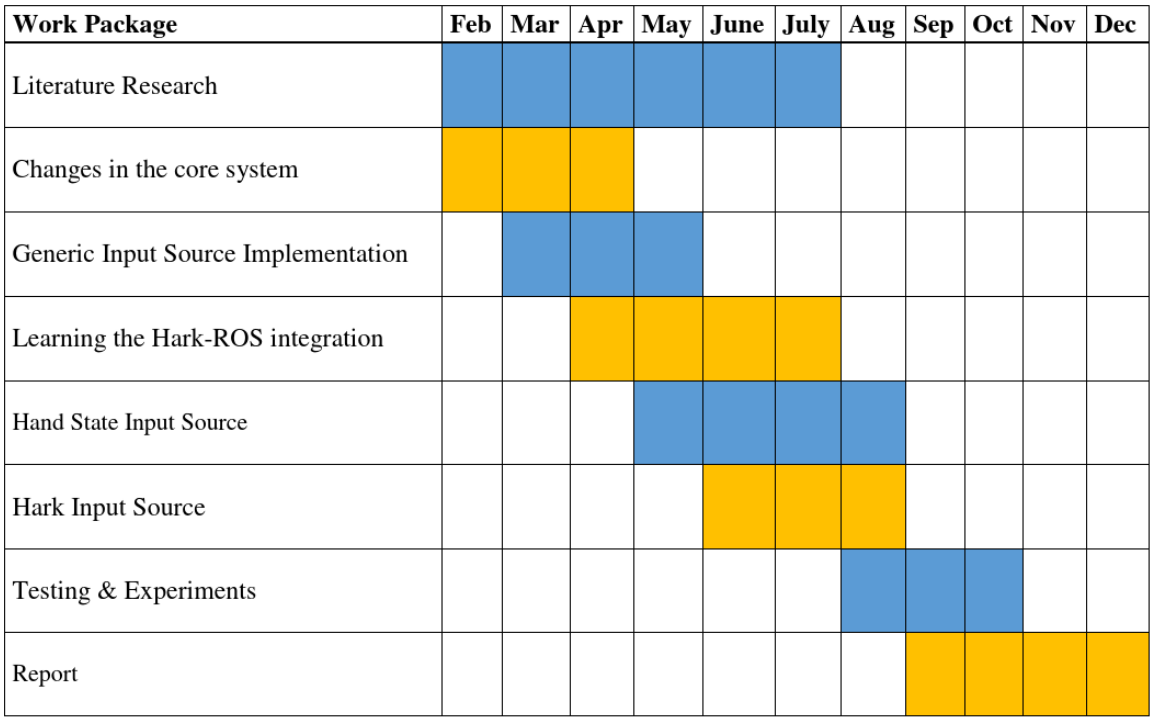


Figure 2.1: The Gantt diagram of the project

3 Background

A long long section with many papers.

4 Analysis and Modeling

After long hours of studying we decided. A* is the best algorithm for searching on the graphs.

5 Design and Implementation

We implemented the depth first search algorithm as shown in Algorithm 5.1.

```
1: Graph G
2: Node start
3: function DEPTH-FIRST-SEARCH(G, start)
4:     Tree T                                          ▷ The resulting search tree
5:     Stack S                                         ▷ An empty stack
6:     Set V                                           ▷ An empty set of visited nodes
7:     SET-ROOT(T,current)
8:     PUSH(S,start)
9:     while NOT-EMPTY(S) do
10:        current ← POP(S)
11:        if not CONTAINS(V, current) then
12:            INSERT(V, current)
13:            for all n : NEIGHBORS(current) do
14:                PUSH(S, n)
15:                INSERT-SUB-NODE(T, current, n)       ▷ Insert node to subtree of
   current
16:            end for
17:        end if
18:    end while
19:    return T
20: end function
```

Algorithm 5.1: The depth first search algorithm

6 Testing and Evaluation

We compared the performance of the graph search algorithms. The results can be seen in the Table 6.1.

Table 6.1: Performance test results of the graph search algorithms

Algorithm	Number of Generated Nodes	Number of Nodes Expanded	Max Number of Nodes in The Frontier
BFS	77480	6340	71142
DFS	820	88	760
A*	376	33	338

7 Conclusion and Future Work

We tested algorithms and decided that future is bright.

References

[1] A. M. Turing, "On computable numbers, with an application to the entscheidungsproblem," *Proceedings of the London Mathematical Society*, vol. s2-42, no. 1, pp. 230–265, 1937. [Online]. Available: http://dx.doi.org/10.1112/plms/s2-42.1.230