School of Computer Science and Technology
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1. Summary

[*Briefly describe the goal of the project.*]

2. Problem definition and background

[*Introduce the problem and state the objective of your work. Briefly present the state of the art regarding the chosen topic and report a reference solution (i.e. numerical or experimental, or the exact one if available).*]

2.1 Literature review

2.2 Reference solution

3. Design of Experiment

[*Describe the process used to meet the project goal.*]

4. Computational model

[*Describe thoroughly the computational model/s used in the project*]

4.1 Problem geometry and setup

4.2 Mesh generation and description

4.3 Numerical schemes

5. Complexity Analysis

5.1 The Total Result

We give the results of the complexity analysis without proof, and then we will give our analysis.
As we can see,

Table 5.1: The Result

Algorithm	**Average**	**Worst Case**
Space	$O(n)$	$O(n \log n)$
Search	$O(\log n)$	$O(n)$
Insert	$O(\log n)$	$O(n)$
Delete	$O(\log n)$	$O(n)$

5.2 Related Definitinos

In order to better analyze the complexity through mathematical means, we will introduce some related concepts in advance, which will help us simplify the analysis

5.2.1 C_m^n

5.3 Space Complexcity

Every time a number is inserted, the program will randomly assign a height for node to storage pointer (less than MaxHeight), so it's Space Complexity is $O(n)$

5.4 Average Time Complexity

5.4.0.1 Definitions

The height of the PSL is expected to be about $log_{\frac{1}{P}} N$. Since, among all elements that made it to a certain level, about every (1/P)th element will make it to the next higher level, one should expect to make 1/p key comparisons per level. Therefore, one should expect about 1/p*log1/p n key comparisons in total, when searching for +. As it will turn out (Theorem 3.3), this is exactly the leading term in the search cost for + in a PSL of n keys.

6. Conclusions

Bibliography

[1] Thomas D Economon, Francisco Palacios, Sean R Copeland, Trent W Lukaczyk, and Juan J Alonso. Su2: An open-source suite for multiphysics simulation and design. *Aiaa Journal*, 54(3):828–846, 2015.

Appendix A: Resources

[*Report the config files of the software used (i.e. SU2 [1] and the mesher). Also attach to this report an archive with the mesh files, solutions and the reference solution data (e.g. data points of a Cp plot ...)*]

Mesh configuration files

SU2 configuration files