Contents

List of Figures *ix*

List of Tables *xiii*

Acknowledgments *xv*

1 Introduction *1*
- 1.1 Data Base System Models
- 1.2 Basic File Organization and File Search Methods
- 1.3 Tree Structures
  - 1.3.1 The Indexed Sequential Access Method
  - 1.3.2 B-Trees
- 1.4 Overview of Study

2 Successive Linear Interpolation *13*
- 2.1 Introduction
- 2.2 Analysis and Model
  - 2.2.1 Analysis of Peterson's Approach
  - 2.2.2 Iterative Methods to find Zeros of Functions
  - 2.2.3 Assumptions and Model
- 2.3 Simulation Results
- 2.4 Complexity of Computations
  - 2.4.1 Analysis of Binary Search
  - 2.4.2 Analysis of Successive Linear Interpolation
  - 2.4.3 Analysis of False Position
  - 2.4.4 Comparison of the three Algorithms
- 2.5 Conclusion

3 Index Points for Sequential Files 45
3.1 Introduction
3.2 Survey of Previous Work
3.2.1 Whitt and Sullenberger's Work
3.2.2 Ghosh and Senko's Work
3.2.3 Held's Thesis
3.3 Optimum Partitioning of a File
3.3.1 Statement of the Problem
3.3.2 Model and Solution
3.3.3 Address Evaluation within Partitions
3.4 Heuristic Partitioning Algorithms
3.4.1 Heuristic Algorithm A′: Single Pass over Data
3.4.2 Algorithm B′: Global Algorithm
3.5 Simulations and Results
3.6 Conclusion

4 Index Trees for Sequential Files 85
4.1 Introduction
4.2 Building the Tree of Indices
4.2.1 Definition of the Problem
4.2.2 Huffman's Algorithm
4.2.3 Dynamic Programming for Binary Trees
4.2.4 The T-C Algorithm
4.2.5 Itai's Algorithm
4.3 Construction and Buffer Management of a Virtual Tree
4.3.1 Description of Problem
4.3.2 Construction of Virtual Tree
4.3.3 Buffer Management of the Virtual Tree
4.4 Simulation Results
4.5 Conclusion

Index 113