**TABLE OF CONTENTS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Title** | | **Page No.** | |
| **LIST OF FIGURES** | | **I** | |
| **LIST OF TABLES** | | **II** | |
| **CHAPTER 1 INTRODUCTION** | | **1** | |
| 1.1 Introduction to the Project | | 1 | |
| 1.2 Introduction to Technology used | | 2 | |
|  | |  | |
| **CHAPTER 2 LITERATURE SURVEY** | | **2** | |
| 2.1 Introduction | | 2 | |
| 2.2 Literature Survey | | 5 | |
| 2.3 Summary of Literature Survey | | 6 | |
| 2.4 Comparison with Existing Systems | | 7 | |
| 2.5 Proposed System | | 8 | |
| 2.6 Objectives | |  | |
|  | |  | |
| **CHAPTER 3 REQUIREMENT SPECIFICATION AND ANALYSIS** | | **10** | |
| 3.1 Introduction | | 10 | |
| 3.2 Functional Requirements | | 10 | |
| 3.3 User Interface Requirements | | 11 | |
| 3.4 Integration with Social Platforms | | 12 | |
| 3.5 Software Requirements | | 12 | |
| 3.5.1 ReactJS | | 12 | |
| 3.5.2 Expo Go | | 12 | |
| 3.5.3 Node.js | | 12 | |
| 3.5.4 PostgreSQL | | 13 | |
| 3.5.5 Visual Studio Code (VS Code) | | 13 | |
| 3.5.6 npm (Node Package Manager) | | 13 | |
| 3.5.7 Image Processing Libraries | | 13 | |
| 3.5.8 Python programming language | | 13 | |
| 3.6 Hardware Requirements | | 14 | |
| 3.6.1 Processor (CPU) | | 14 | |
| 3.6.2 Memory (RAM) | | 14 | |
| 3.6.3 Network Connectivity | | 14 | |
|  | |  | |
| **CHAPTER 4 SYSTEM DESIGN** | | **15** | |
| 4.1 Introduction | | 15 | |
| 4.2 User Interface (Frontend – React Native) | | 15 | |
| 4.3 Prediction Engine - Python | | 16 | |
| 4.4 Database – PostgreSQL | | 16 | |
| 4.5 Flask | | 17 | |
| 4.6 System Architecture | | 18 | |
| 4.7 Flowchart | | 19 | |
| 4.8 Use Case Diagram | | 21 | |
|  | |  | |
| **CHAPTER 5 SYSTEM IMPLEMENTATION** | | **23** | |
| 5.1 Introduction | | 23 | |
| 5.2 Step-by-Step Explanation of the Foot Size Prediction Pipeline | | 23 | |
| 5.2.1 Image Input: Capture or Upload | | 23 | |
| 5.2.2 Image Preprocessing | | 24 | |
| 5.2.3 Foot Segmentation using Clustering | | 24 | |
| 5.2.4 Edge Detection | | 24 | |
| 5.2.5 Bounding box Extraction | | 24 | |
| 5.2.6 Cropping the Foot Region | | 25 | |
| 5.2.7 Secondary Edge Detection and Bounding Box | | 25 | |
| 5.2.8 Pixel Dimension Calculation | | 25 | |
| 5.2.9 Conversion to Real-World Size (mm/cm) | | 25 | |
| 5.3 Formula | | 26 | |
| 5.4 Final Output | | 26 | |
| 5.5 Requirements for Accurate Results | | 26 | |
| 5.5.1 Complete Placement of the Foot on A4 Paper | | 27 | |
| 5.5.2 High-Quality, Well-Lit Images | | 27 | |
| 5.5.3 Flat, Undistorted Paper Surface | | 27 | |
| 5.5.4 Proper Camera Positioning (Top-Down Angle) | | 27 | |
| 5.6 Implementation Flow of the System | | 28 | |
|  | |  | |
| **CHAPTER 6 SYSTEM TESTING** | | **30** | |
| 6.1 Introduction | | 30 | |
| 6.2 Unit Testing | | 30 | |
| 6.2.1 Python Unit Tests | | 30 | |
| 6.2.1 JavaScript Unit Tests | | 30 | |
| 6.3 Integration Testing | | 31 | |
| 6.4 Functional Testing | | 31 | |
| 6.5 System Testing | | 31 | |
| 6.6 Sample Test Cases | | 32 | |
|  | |  | |
| **CHAPTER 7 EXPERIMENTAL RESULTS AND SCREENSHOTS** | | **33** | |
|  | |  | |
| **CHAPTER 8 CONCLUSION & FUTURE SCOPE** | | **37** | |
| 8.1 Conclusion | | 37 | |
| 8.2 Future Enhancements | | 37 | |
|  | |  | |
| **REFERENCES** | | **39** | |
|  | |  | |
| **PERSONAL PROFILE** | | **41** | |
|  | |