**DECLARATION**

We hereby declare that the Capstone Project Phase - 1 entitled **“Indexing and Summarization of Sports Videos using Multi-Modal Approach”** has been carried out by us under the guidance of **Dr. Sandesh B.J, Chairperson & Professor** and submitted in partial fulfillment of the course requirements for the award of the degree of **Bachelor of Technology** in **Computer Science and Engineering** of **PES University, Bengaluru** during the academic semester January – May 2024. The matter embodied in this report has not been submitted to any other university or institution for the award of any degree.

| **Krupashree MV**  **Meenal Bagare**  **Melvin Jojee Joseph**  **Naveen Reddy G** | **PES2UG21CS242**  **PES2UG21CS289**  **PES2UG21CS294**  **PES2UG21CS324** |  |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

**ACKNOWLEDGEMENT**

We would like to express our gratitude to **Dr. Sandesh B J,** Chairperson and Professor, Department of Computer Science and Engineering, PES University, for his continuous guidance, assistance, and encouragement throughout the development of this UE21CS390A - Capstone Project Phase – 1.

We are grateful to all Capstone Project Coordinators, for organizing, managing, and helping with the entire process.

We take this opportunity to thank Dr. Sandesh B J, Professor & Chairperson, Department of Computer Science and Engineering, PES University, for all the knowledge and support we have received from the department. We would like to thank Dr. B.K. Keshavan, Dean of Faculty, PES University for his help.

We are deeply grateful to Dr. M. R. Doreswamy, Chancellor, PES University, Prof. Jawahar Doreswamy, Pro-Chancellor, PES University, Dr. Suryaprasad J, Vice-Chancellor, PES University, and Prof. Nagarjuna Sadineni, Pro-Vice Chancellor, PES University, for providing us with various opportunities and enlightenment every step of the way. Finally, Phase 1 of the project could not have been completed without the continual support and encouragement we have received from our family and friends.

**ABSTRACT**

Traditional methods of sports summarization heavily depend on large teams of manual editing, where enormous portions of game footage are picked over through by humans to select the most crucial moments for the compilation of highlights. This is, however, a time-consuming, resource-intensive, and uneven-coverage of events. Our work proposes a novel, multi-modal approach to sports summarization, in which all things are combined: Twitter data, audio features, and video content are finally computed to automate and enhance the entire process of sports summarization. This approach is based on the integration of diverse sources of information, which should streamline the summarization process and hence enhance efficiency in covering sports events. This methodological novelty has the potential to transform sports summarization into a scalable and efficient solution, delivering engaging and informative highlights to sports enthusiasts from all over the globe.

**TABLE OF CONTENTS**

| **Chapter No.** | **Title** | **Page No.** |
| --- | --- | --- |
|  | **INTRODUCTION** | **01** |
|  | **PROBLEM DEFINITION** | **03** |
|  | **LITERATURE SURVEY** | **05** |
|  | **DATA**  4.1 Overview  4.2 Dataset | **10** |
|  | **SYSTEM REQUIREMENTS SPECIFICATION**  5.1 Operating System  5.2 General Constraints, Assumptions and Dependencies  5.3 Risks  5.4 Functional Requirements  5.5 Software Requirements  5.6 Communication Interfaces  5.7 Non-Functional Requirement  5.8 Safety Requirements  5.9 Security Requirements | **13** |
|  | **SYSTEM DESIGN (detailed)**  6.1 High Level Architecture  6.2 Master Class Diagram  6.3 Use Case Diagram  6.4 Deployment Diagram  6.5 Swimlane Diagram | **22** |
|  | **IMPLEMENTATION/ PSEUDOCODE** | **32** |
|  | **CONCLUSION OF CAPSTONE PROJECT PHASE - 1** | **36** |
|  | **PLAN OF WORK FOR CAPSTONE PROJECT PHASE - 2** | **37** |
| **REFERENCES/BIBLIOGRAPHY** | | **38** |
| **APPENDIX A DEFINITIONS, ACRONYMS, AND ABBREVIATIONS** | | **40** |
|  | |  |

**LIST OF FIGURES**

| **Figure No.** | **Title** | **Page No.** |
| --- | --- | --- |
|  |  |  |
| **6.1**  **6.2**  **6.3**  **6.4**  **6.5** | **High Level Architecture Design Diagram**  **Master Class Diagram**  **Use Case Diagram**  **Deployment Diagram**  **Swimlane Diagram** | **22**  **26**  **28**  **30**  **31** |