Functional Requirements Document (FRD)

1. Introduction

- Purpose: The purpose of this document is to define the functional requirements for an Athlete Performance Analysis System. The system aims to provide athletes and coaches with detailed insights into performance using data collected from them.

- Scope: The scope of this project includes using athletes data collected to track athlete performance metrics and providing an interface for athletes and coaches to view and analyze these metrics.

2. System Overview

The system will gather performance data from athletes using a dataset and present this data in an intuitive and actionable format. It will allow coaches and athletes to track performance over time and identify areas for improvement.

3. Functional Requirements

3.1 User Management

- User Registration and Authentication
  - The system should allow athletes and coaches to register and create individual accounts.
  - Users should be able to log in securely using a username/email and password.
- User Roles and Permissions
  - The system should define two primary user roles: Athlete and Coach.
  - Coaches should have the ability to view and analyze the performance data of athletes they are coaching.
  - Athletes should be able to view and track their own performance data.
- Profile Management
  - Users should be able to manage their profiles, including updating personal information and changing passwords.

3.2 Using Dataset

- Data Collection
  - The system should integrate with wearable devices (e.g., smartwatches, fitness bands) to collect real-time performance data but since in current scenario since it's not able to, we are using dataset for the same.
- Supported Metrics
  - The system should collect various performance metrics based on the type of sport, such as:
    - Heart rate
    - Speed and distance
    - Caloric burn
    - Step count and cadence
    - Sleep patterns (if applicable)

- Sport-specific metrics (e.g., passing accuracy for soccer, stroke count for swimming)

3.3 Performance Analysis and Insights

- Dashboard and Visualization
  - The system should provide a dashboard that displays key performance metrics in an easy-to-understand format.
- Goal Setting and Progress Tracking
  - Athletes should be able to set performance goals (e.g., improve run time, increase passing accuracy).
  - The system should track progress toward these goals and provide feedback on performance.
- Automatic Insights
  - The system should analyze the collected data to provide basic insights into an athlete's strengths and areas for improvement.
  - Insights may include suggestions for training adjustments based on performance patterns.

3.4 Notifications and Alerts

- Performance Alerts
  - The system should send alerts to users when specific performance thresholds are reached (e.g., heart rate exceeds a set limit).

3.5 Data Security and Privacy

- Data Privacy
  - The system should ensure that user data is securely stored and not accessible to unauthorized users.
  - Users should have control over who can view their performance data.

3.6 Reports and Export

- Report Generation
  - Users should be able to generate performance reports that include detailed metrics and trends.

3.7 Feedback and Support

- User Feedback
  - The system should provide a way for users to submit feedback and report issues.

4. Non-Functional Requirements

4.1 Performance

- The system should handle simultaneous data synchronization from multiple users without significant delay.

4.2 Scalability

- The system should be able to scale to accommodate a large number of users.

4.3 Usability

- The user interface should be intuitive and accessible to users of varying technical skill levels.
- The system should be optimized for both desktop and mobile devices.

4.5 Security

- The system should implement security best practices, including secure authentication and data encryption.

5. Assumptions and Constraints

- The system assumes that the dataset provided is preprocessed.

6. Future Enhancements

- Advanced Data Analytics: Adding machine learning algorithms for advanced performance analysis.

- Video Analysis: Integrating video analysis for technique improvement (out of scope for this version).

- Third-Party Integrations: Expanding integration to support wearable devices and fitness platforms.

This FRD covers the essential functionalities for building an athlete performance analysis system, providing users with insightful and actionable performance data.