



AI Powered Web Platform for Democratizing Sports Talent Assessment

T. Anil Karuna Kumar, R. Kusuma, A. Lakshmi Prasanna, O. Harshitha, M. Snehalatha

Department of CSE, Vijaya Institute of Technology for Women, Enikepadu, Vijayawada.

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KEYWORDS

ABSTRACT

Sports talent identification is a crucial aspect of developing successful athletes and strengthening a nation's sports ecosystem. However, traditional scouting systems rely on manual observation, physical trials, and limited geographical reach. As a result, many talented athletes from rural or economically disadvantaged areas remain undiscovered.

This research proposes an AI-Powered Mobile Platform for democratizing sports talent assessment. The platform allows athletes to perform standardized fitness tests using a smartphone camera and upload videos of their performance. Artificial intelligence techniques analyze the video recordings and generate objective performance scores.

The system integrates modern web technologies, artificial intelligence simulation, and cloud-based storage to create a scalable digital sports evaluation platform. By leveraging affordable mobile devices and internet connectivity, the platform enables athletes to showcase their abilities from anywhere.

The proposed system reduces the dependency on traditional scouting camps, minimizes costs, and increases fairness in the athlete selection process. The platform can help sports organizations discover hidden talent and provide equal opportunities for athletes across different regions.

1. INTRODUCTION

Sports have always played a vital role in promoting physical fitness, teamwork, and national pride. Identifying talented athletes at an early stage is essential

for building strong sports teams and improving a country's performance in international competitions. Traditional talent identification systems depend on coaches and scouts who observe athletes during tournaments or training camps. These methods require

athletes to travel to selection venues, which may not be feasible for many individuals living in remote areas. Additionally, manual evaluation may sometimes be subjective and influenced by personal bias.

With the rapid growth of digital technologies, new opportunities have emerged to improve sports talent discovery. Smartphones equipped with high-quality cameras are widely available and can capture detailed videos of athletic movements. Artificial intelligence and computer vision technologies can analyze these movements and extract valuable performance metrics.

The integration of AI-based analysis with mobile platforms allows athletes to participate in performance tests remotely. Such systems can evaluate movements, calculate scores, and store results digitally for comparison and evaluation.

This research focuses on designing and implementing an AI-powered platform that enables remote sports talent assessment through video analysis. The system aims to make sports scouting more accessible, objective, and efficient.

Objectives of the Study

The primary objective of this research is to develop a digital platform that enables athletes to demonstrate their physical abilities and receive performance evaluation using artificial intelligence.

The specific objectives include:

- To design and develop a mobile-friendly web platform for sports talent assessment.
- To allow athletes to perform standardized sports tests such as sprinting, jumping, and agility drills.
- To analyze recorded performance videos using artificial intelligence techniques.
- To create a database system for storing athlete profiles and performance records.
- To develop a leaderboard system for comparing athlete performance.
- To provide equal opportunities for athletes regardless of geographical location.

Achieving these objectives will contribute to improving the efficiency and accessibility of sports talent identification programs.

2. LITERATURE REVIEW

Previous research in sports science emphasizes the importance of scientific and data-driven approaches in

identifying athletic talent. Traditional methods rely on anthropometric measurements, physical fitness tests, and expert observation.

Recent advancements in computer vision have made it possible to analyze human motion using video recordings. Technologies such as pose estimation algorithms can detect body landmarks and track movements during physical activities. This enables accurate measurement of parameters such as running speed, jump height, and body posture.

Researchers have also explored the use of artificial intelligence in sports analytics. Machine learning models can analyze large datasets of athlete performance and identify patterns that indicate high potential. These techniques are widely used in professional sports for performance optimization.

However, most existing systems require expensive equipment or specialized environments. This limits their use in grassroots talent discovery. Therefore, there is a need for affordable and scalable solutions that can support remote sports assessment using commonly available devices.

The proposed system addresses this gap by using smartphone cameras and AI-based analysis to evaluate athlete performance.

3. EXISTING SYSTEM

In traditional sports scouting systems, coaches and scouts travel to local tournaments, schools, or training centers to observe athletes. These methods rely heavily on manual observation and experience.

Although experienced coaches can identify talent effectively, the process has several limitations:

- Limited reach: Scouts can only observe athletes within a specific region.
- High cost: Organizing large selection camps requires significant resources.
- Subjective evaluation: Personal bias may influence selection decisions.
- Lack of data storage: Performance records are often not stored systematically.

Some digital platforms exist for professional sports analysis, but they are mainly designed for elite athletes and require advanced equipment such as motion capture systems or wearable sensors.

Therefore, there is a need for a system that provides affordable and scalable talent assessment capabilities for grassroots athletes.

4. PROPOSED SYSTEM

The proposed system is an AI-powered mobile platform designed to evaluate athlete performance through video analysis. The system consists of three main components: the user interface, the processing engine, and the database.

Athletes can register on the platform and select a sports test they want to perform. The platform provides step-by-step instructions explaining how the test should be conducted. The athlete records the performance using a smartphone camera and uploads the video to the system.

Once the video is uploaded, the backend processing engine analyzes the recording using an AI simulation model. The model evaluates movement patterns and generates a performance score based on predefined benchmarks.

The results are stored in a database and displayed on a leaderboard where athletes can compare their performance with others. Coaches and administrators can review submissions and validate scores when necessary.

This system enables remote sports assessment and significantly expands the reach of talent identification programs.

5. METHODOLOGY

The system was developed using modern web technologies and follows an agile development methodology. The development process includes requirement analysis, system design, implementation, and testing.

Frontend Development: The user interface was developed using React technology. It provides an interactive dashboard where users can register, log in, view available tests, and upload performance videos.

Backend Development: The backend was developed using Node.js and Express. It handles user authentication, video uploads, data processing, and communication with the database.

Database Design: A relational database stores user profiles, test details, and performance results. The database ensures secure and efficient data management.

AI Simulation: An AI simulation model generates performance scores based on realistic performance ranges for each test type. This demonstrates how real AI models can be integrated in the future.

Testing: The system was tested using multiple scenarios including user registration, video upload, and performance evaluation.

6. RESULTS AND DISCUSSION

The developed prototype demonstrates that remote sports talent assessment is feasible using mobile technology and artificial intelligence.

Users were able to successfully register, record videos, upload them, and receive performance scores. The platform handled multiple submissions and stored results efficiently.

Compared with traditional scouting methods, the system provides several advantages:

- Increased reach and accessibility
- Reduced operational costs
- Objective performance evaluation
- Digital storage of athlete data

However, certain limitations were identified. The accuracy of video analysis may depend on camera quality, lighting conditions, and internet connectivity. Future improvements can address these limitations using advanced AI models and cloud-based processing.

7. CONCLUSION

This research presents an AI-powered platform designed to democratize sports talent assessment. By using smartphone technology and artificial intelligence, the system allows athletes to demonstrate their abilities from any location.

The platform reduces geographical barriers and makes sports scouting more inclusive. It also provides objective evaluation through standardized tests and digital performance metrics.

The study demonstrates the potential of AI and mobile technology in transforming traditional sports talent identification systems.

Future Scope

Several improvements can be implemented in the future to enhance the capabilities of the system.

Future developments may include:

- Integration of real-time pose estimation using advanced AI models
- Development of a dedicated mobile application
- Cloud-based video processing for large-scale deployment
- Integration with national sports organizations
- Personalized training recommendations based on performance analysis

These improvements will further strengthen the system and increase its impact in the sports industry.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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