TALENT TRACK

AI Sports Assessment Through Mediapipe

Paper Presentation
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PROPOSED SOLUTION

Talent Track is an AI-powered mobile platform that democratizes sports talent assessment by enabling athletes across India, especially from rural areas, to showcase their skills through standardized fitness tests. The platform ensures fairness, transparency, and accessibility by combining on-device AI with secure data handling.

- Athletes record videos of prescribed fitness tests (jump, shuttle run, sit-ups, etc.).
- On-device AI/ML analyzes movements for accuracy, repetition counts, and timing.
- Offline video analysis ensures usability in low-network rural regions.
- AI-based cheat detection ensures authenticity of submissions.
- Instant performance feedback with age/gender benchmarks.
- Verified results sync securely to SAI servers for profiling and evaluation.

Talent Track

IDEA/SOLUTION

Talent Track is a mobile app that allows athletes to showcase their talent anytime, anywhere using AI. Built with Flutter, it runs seamlessly on all devices. The app uses OpenCV and MediaPipe for video-based motion and posture analysis, giving instant feedback.

Talent Track doesn't just record results, it teaches athletes how to improve with **real-time guidance** and **gamified motivation**. By combining **offline AI analysis**, curated for **Para-athletes** too, with **coach and SAI integration**, we turn simple video tests into a complete growth journey.

JUSTIFICATION FOR SDG

TITLE	PRIMARY	SECONDARY	TERTIARY
GOAL	4 (Quality Education)	3 (Good Health and Well-Being)	10 (Reduced Inequalities)
TARGET	Target 4.5 – Ensure equal access to sports training and education for persons with disabilities and rural communities.	Target 3.4 – Reduce premature mortality by promoting health and fitness through accessible talent programs.	Target 10.2 – Empower and promote inclusion of all, especially athletes from underserved regions and differently-abled groups.

TECHNICAL APPROACH

FastAPI TensorFlow SQLite
MediaPipe OpenCV CSV Reports

Talent Track

App UI, Website UI

Supported Workouts

Situps

Vertical Jump

Pushup

Sit & Reach

Shuttle Run

Pullup

Broad Vertical Jump

Technical Workflow

Technical Workflow

Floor

Head

Bar

Heigh

t

Ground

BUSINESS MODEL CANVAS

KEY PARTNERS

- Sports Authority of India (SAI)
- Schools, colleges, and sports clubs
- Technology partners for AI and cloud services
- NGOs supporting rural and differently-abled athletes

KEY ACTIVITIES

- AI-powered fitness assessment and verification
- Gamification: badges, XP, coins, leaderboards

KEY RESOURCES

- Cloud infrastructure for data handling
- Partnerships with educational and sports bodies

VALUE PROPOSITIONS

- Accessible talent discovery across India
- Fair and cheat-proof assessments using AI
- Encourages sustained participation with rewards
- Supports differently-abled athletes with tailored exercises

CUSTOMER RELATIONSHIP

- Automated feedback and progress tracking
- Community-driven engagement and leaderboards

CHANNELS

- Mobile apps (Android & iOS)
- School and government networks

CUSTOMER SEGMENTS

- Students from urban and rural areas
- Differently-abled athletes
- Schools, colleges, and coaches
- Government bodies and sports organizations

COST STRUCTURE

- Development and maintenance
- Cloud hosting and data storage
- Marketing and partnerships
- Accessibility features and content creation

REVENUE STREAM

- Government grants and funding
- Subscription-based premium features
- Sponsored events and partnerships
- Certification and training programs

SPORTS TRACKER

EFFICIENCY OF SOLUTION

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Activate Windows
Go to PC settings to activate Windov
Activate Windows

CLOUDSIM

Key Aspects

Technical Feasibility

We use OpenCV + MediaPipe for AI analysis, making video processing lightweight, accurate, and suitable even for entry-level smartphones.

Market Feasibility

Our app taps into the huge pool of rural and semi-urban athletes, backed by programs like Khelo India and SAI, ensuring real adoption.

Financial Feasibility

Built with open-source AI frameworks and on-device processing, reducing server costs, while funding support comes from government and CSR.

Operational Feasibility

A gamified, simple mobile UI allows easy use by athletes with basic digital literacy, while reports auto-sync to coaches and SAI for smooth operations.

MULTI SPORT EXPANSION
All 10 SAI fitness tests can be performed and assessed through the platform, with scope to expand into multiple sports in the future.

AFFORDABLE AI ADVANTAGE
80% cost reduction with offline-first AI.

ATHELETE-CENTRIC VALIDATION
Athletes from all regions get equal opportunity to participate, gain fair evaluation, and showcase their talent.

CONNECTED TALENT ECO SYSTEM
Athlete → Coach → SAI → Training Camps workflow.

FEASIBILITY AND VIABILITY

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Technical Feasibility

- Secure Access & Data - Authentication, account management, and safe user storage.
- AI Analysis & Engagement - Video verification, cheat detection, and gamified progress.

Market Feasibility

- Rural & Semi-Urban Talent Pool - Large base of untapped aspiring athletes.
- Strong Institutional Support - Backend by Khelo India, SAI, and schools/academics.

Financial Feasibility

- Cost-Effective Deployment - Open-source AI and on-device processing reduce expanses.
- Sustainable Funding Support - Backend by government, CSR, and sports federations.

Operational Feasibility

- User - Friendly & Engaging UI - Gamified design with easy navigation.
- Automated & Scalable System - Test segmentation and seamless SAI integration.

SCALABILITY

- Offline Vedio Analysis
- Low-Network Accessibility
- Lightweight AI Models
- Multi-Sport Expansion

SUSTAINABILITY

- On-Device Processing
- Offline-First Design
- Government Program Support
- CSR & Federation Backing

ADOPTION POTENTIAL

- Rural Athlete Inclusion
- Gamified Participation Boost
- Instant Offline Feedback
- School & Academy Adoption

INTEGRATION

- Secure Data Sync
- Centralized Dashboard Access
- Future AI Coaching
- Cross Platform Integration

Market Changes

SMART INDIA HACKATHON 2025

Equal Sports Opportunities

↓

Low-Cost Assessments

↓

Transparent Performance Tracking

↓

Transparent Performance Tracking

Data-driven training: SportsSkill wants all athletes to access performance-tracking

Founded in 2021, Pune-based SportsSkill caters to athletes, parents, coaches, and academies, with 1,000+ downloads and active users across cities including Hyderabad, Indore, and Mumbai. Article Link

Unlike existing systems like SportsSkill that rely on wearables, our platform works with just a **Basic Smartphone** and is also designed to support **Para-athletes**.

Survey Link

Onboarding and data capture

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AI performance analysis

↓

Gamified Progress Tracking

↓

Integrated Talent Pathway

IMPACTS AND BENEFITS

Social

- Equal platform for athletes from rural & urban areas.
- Increases youth participation in sports & fitness.
- Builds trust through transparent AI-driven evaluation.

Cultural

- Boosts India's sports ecosystem by nurturing hidden talent and enhancing global competitiveness.
- Enhances India's global representation and competitiveness in sports.

Economic

- Reduces costs of large-scale scouting & physical camps
- Helps authorities invest early in medal-potential athletes.
- Promotes sports as a viable career path.

Technological

- Offline AI analysis ensures access in low-connectivity regions.
- Cheat detection improves reliability of assessments.
- Creates a scalable digital ecosystem for sports talent tracking.

ATHLETES

Fair, location-independent assessments.
Instant feedback with benchmarks.
Motivation through gamified rewards.

SPORTS AUTHORITIES

Standardized digital drills for consistency. Region-specific modules address local risks. Easy tracking of preparedness through dashboards.

SOCIETY

Promotes inclusivity and equal access.
Encourages youth fitness and discipline...
Builds pride in local sports talent.

FUTURE GROWTH

Expandable to multiple sports tests. Integration with wearables and biometrics. Sustainable, low-cost long term platform.

PATENT ELIGIBILITY

1. **Offline Video Analysis Algorithm:**

   Extracts fitness metrics from low-quality smartphone videos without internet.

2. **Adaptive Test Segmentation:**

   Automatically identifies test phases despite lighting and angles.

3. **AI Cheat Detection Model:**

   Verifies video authenticity by analyzing motion and timestamps.

4. **Inclusive Benchmarking System:**

   Adjusts performance comparisons for age, gender, and disabilities.

5. **Offline-first Architecture:**

   Securely stores and syncs data in low-connectivity areas.

6. **Gamified Engagement System:**

   Personalized badges and feedback based on performance.

7. **Secure Sync Protocol:**

   Ensures encrypted data transfer during intermittent connectivity.

Adaptive Segmentation

Automatically identifies test phases despite lighting and angles.

AI Cheat Detection

Verifies video authenticity by analyzing motion and timestamps.

Inclusive Benchmarking

Adjusts performance comparisons for age, gender, and disabilities.

Offline Architecture

Securely stores and syncs data in low-connectivity areas.

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Secure Sync Protocol

Ensures encrypted data transfer during intermittent connectivity.

SURVEY RESULTS

ACCESSIBILITY

Helps athletes from rural and underserved areas access fitness assessments.

ENGAGEMENT

Gamified features and instant feedback motivate continued use.

IMPROVEMENTS

Users suggest adding adaptive tests and clearer instructions.

INCLUSION

- Appreciated for supporting differently-abled and diverse participants.

Survey Results

Supported Workouts

RESEARCH AND REFERENCES

1. [Fusion of Video and Inertial Sensing for Deep Learning]
2. [Vision and Inertial Sensing Fusion for Human Action Recognition]
3. [Transformer-based Sensor Fusion for Human-Centric Multi-view and Multi-modal

Article Link

Our inspiration came from seeing how many young athletes in rural areas struggle to showcase their talent due to lack of access to proper facilities or costly wearables. We wanted to build a simple, smartphone-based solution that could bring fair opportunities to every aspiring sportsperson, no matter where they come from.

Article Link