AI-BASED POSTURE ANALYSIS

Our Physio, Your Therapy

We are building an **AI-powered physiotherapy and personal training platform** designed to make rehabilitation, injury prevention, and overall fitness more effective and accessible. Today, access to trained physiotherapists is a global challenge; as per the World Health Organization, there are **fewer than one physiotherapist per 10,000 people worldwide**.

At the same time, with the rapid growth of **at-home fitness, yoga, and gym practices**, the need for **real-time, expert-level posture correction** has never been greater. Incorrect form often leads to delayed recovery, recurring injuries, and reduced exercise benefits.

Our solution directly addresses this gap. We are developing a **low-cost, sensor-free, phone based, AI-driven posture analysis and correction system** that uses **computer vision and medical expertise** to guide users in real time. The platform provides **instant visual and audio feedback** during physiotherapy sessions or workouts, helping users maintain correct posture, avoid injuries, and achieve faster, safer recovery.

Problem Statement

1. **Shortage of Physiotherapists** – Less than 1 **Physiotherapists** per 10,000 people (According to WHO).
2. **Inconsistent Posture Guidance** – Patients often fail to maintain correct form during recovery exercises.
3. **Manual Observation Limitations** – Time-consuming, error-prone, and subjective.
4. **Lack of Affordable Solutions** – No widely available low-cost, **non invasive, camera only** real time feedback systems.
5. **High Risk of Re-Injury** – Incorrect form leads to musculoskeletal injuries such as ACL tears, cervical spondylosis, disc herniation

Solution We Are Providing

We propose a **Computer Vision–based Physiotherapy Assistance Platform** that:

- Detects human pose using **skeleton tracking (MediaPipe/OpenCV)**.
- Analyses **joint angles** for posture correctness.
- Provides **real-time visual and audio corrective feedback**.
- Tracks **exercise repetitions and accuracy** (e.g., squats, yoga, sitting posture).
- We will provide the dashboard of the exercises which the users are performing.
- Integrates **in-app physiotherapy consultancy** for expert advice

Technical Architecture

1. **Pose Detection Layer** – MediaPipe/OpenPose captures body landmarks (shoulders, elbows, hips, knees, ankles).
2. **Posture Correction Engine** – Compares detected angles with **expert-defined medical thresholds** (±10° tolerance).
    - Example: Spine neutral alignment, hip-knee-foot at ~90° for sitting posture.
    - Example: Squat knee flexion ~90° without passing toes.
3. **Feedback Interface** – Real-time on-screen/audio corrections (e.g., *"Straighten your back"*).
4. **Repetition Counter & Analytics** – Tracks progress and excludes incorrect reps.
5. **Consultancy Module** – Users can directly connect with certified physiotherapists.

Comparison with Existing Apps

App / Feature	Our Model	Wizio	FitAI	APECS	Fitify Yoga
Posture Correction	Real-time, medical-grade	Limited (athletic)	Basic fitness form	Sports-focused	Gulded videos only
Sensors Needed	No	Yes	Yes	Partial	No
Physiotherapy Focus	Yes	No	No	No	Yes
Consultancy	Yes	No	No	No	Yes
Gamification	Yes	No	No	No	No
Target Users	Clinics, gyms, home, elderly	Athletes	Fitness users	Sports rehab	Clinics, patients

Target Audience

1. **Physiotherapy Clinics & Hospitals** – For rehabilitation and accurate recovery monitoring.
2. **Fitness Centers & Gyms** – Ensuring correct forms.
3. **Athletes & Sports Injury Recovery** – Preventing reinjury with AI-guided training.
4. **Elderly Users** – Safe mobility, fall prevention, home therapy.
5. **Yoga Practitioners & Hybrid Users** – Real-time correction during at home workout.

Business Model & Revenue Strategy

1. B2B Sales (Clinics, Hospitals, Gyms, Fitness Studios, Personal Trainers)

- The platform can be licensed to **physiotherapy clinics, hospitals, gyms, yoga centers, and certified trainers**.
- These institutions can deploy the system with **multiple patients/clients** for rehabilitation and training.
- **Pricing Strategy:** Annual licensing fee per clinic/center, ranging from **₹10,000 to ₹50,000 per year**, depending on features.
- **Upselling Opportunity:** Add-ons like a **Therapist Dashboard** (analytics, patient progress tracking) and **mobile app integration** for remote monitoring.

2. Tele-Physiotherapy Marketplace (B2C within the App)

- The platform will host a **digital marketplace** connecting patients directly to certified physiotherapists.
- Patients can book **virtual consultations and guided therapy sessions**.
- **Revenue Model:** Platform earns a **10–20% commission** per consultation.
    - Example: If a patient pays **₹500 per session**, the platform earns **₹100**.
- This ensures a continuous revenue stream from **individual end users** while providing affordable physiotherapy access at scale.