

FitBuddy – AI Fitness Coach & Form Tracker

1. Project Overview

FitBuddy is a mobile-first AI-powered fitness coach that uses on-device pose detection to track workout form in real time. It provides instant feedback, rep quality scoring, and imbalance detection — helping users train smarter, safer, and more effectively, all through their smartphone camera.

2. Key Features

-  Real-time pose detection using TensorFlow.js (BlazePose)
-  Rep counting with quality scoring (form analysis)
-  AI-powered posture imbalance detection (left–right / front–back)
-  Adaptive workout generator based on user fatigue and soreness
-  Spoken and visual feedback with no extra hardware
-  Progress tracking with optional cloud sync
-  Sleek, responsive UI with gradient design and intuitive navigation

3. Technologies Used

- **Frameworks & Languages:** React Native, Expo, TypeScript
- **AI & Pose Detection:** TensorFlow.js BlazePose
- **State Management:** React hooks
- **Storage:** AsyncStorage (local)
- **Navigation:** Expo Router
- **UI/UX:** React Native Reanimated, Expo LinearGradient, Lucide Icons
- **Camera & Vision:** Expo Camera

4. How It Works

1. User opens the app and grants camera permission.
2. The camera captures body movements.
3. AI models analyze the pose in real time.
4. Feedback is given visually and verbally on form and rep quality.
5. Progress is saved and displayed in the Analytics and Progress sections.

5. What Makes It Unique

- Entirely sensor-free experience
- On-device real-time analysis (no need for server calls)
- Personalized form feedback and imbalance detection
- Intelligent workout adaptation based on fatigue

6. Development Challenges

- Fine-tuning BlazePose for mobile performance
- Real-time animation syncing with AI output
- Managing camera and pose detection efficiently in Expo
- Ensuring accurate and non-disruptive rep feedback

7. What I Learned

- Building responsive, real-time AI apps in React Native
- Optimizing pose detection performance on mobile
- Managing animations and UI states effectively
- Working with camera streams and TensorFlow models

8. What's Next

- Cloud sync with user authentication
- Video replay with pose overlay
- Voice-coached full workout sessions
- Community leaderboard and challenges