FitVision — AI-Powered Multi-Exercise Workout Tracker

FitVision is a real-time, computer-vision–based workout tracking system that uses **MediaPipe Pose**, **OpenCV**, and **Python** to detect body movements, count repetitions, provide live feedback, and record workout sessions automatically.

It supports multiple exercises with intelligent pose analysis, voice-based motivation, live performance graphs, and video recording—making it ideal for **home workouts, fitness demos, and AI-based health applications**.

Key Features

- **AI Pose Estimation** using MediaPipe Pose

- **Multi-Exercise Support:**

    - ❖ Push-ups
    - ❖ Squats
    - ❖ Bicep Curls
    - ❖ Jumping Jacks
    - ❖ Shoulder Press

- **Accurate Rep Counting** with angle & distance thresholds

- **Real-Time Voice Feedback & Motivation** (optional)

- **Live Performance Graphs** (angles / movement metrics vs time)

- **Workout Video Recording** with overlays (MP4)

- **Automatic Data Logging**

    - ❖ CSV export
    - ❖ Excel export

- ⚡ **Exercise Speed & Duration Analysis**

- **Keyboard Controls** for exercise switching, reset, save, and recording

- **Clean UI Overlays** with posture status and visual indicators

Tech Stack

- **Python**

- **MediaPipe**

- **OpenCV**

- **NumPy**

- **Matplotlib**

- **Pandas**

- **pyttsx3** (for voice feedback)

Use Cases

- AI-powered fitness coaching

- Home workout tracking

- Computer vision projects

- Human pose analysis research

How It Works (High-Level)

1. Captures live video from webcam

2. Extracts human pose landmarks using MediaPipe

3. Computes joint angles / distances

4. Applies exercise-specific thresholds

5. Counts reps and provides feedback

6. Logs workout metrics and records video

Controls Summary

- 1–5 → Select exercise
- SPACE → Start/Stop video recording
- s → Save workout data
- r → Reset current exercise
- v → Toggle voice feedback
- n / p → Next / Previous exercise
- q → Quit

Why FitVision?

FitVision goes beyond basic rep counting by combining **real-time analytics**, **visual feedback**, and **motivational coaching**, making it a complete AI fitness assistant built entirely with open-source tools.