

FitMaster Project Description

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Presentation

FitMaster is an innovative web-based application that transforms a simple webcam into an intelligent personal coach. By combining artificial intelligence, computer vision, and real-time feedback, it guides users through their workouts as if a trainer were by their side. Beyond counting repetitions, it analyzes posture, provides instant corrections, motivates with visual and vocal feedback, and answers questions through an integrated chatbot. FitMaster was designed to make high-quality coaching more accessible, safer, and more engaging for everyone, regardless of time, budget, or fitness level.

Motivations for Creation

The FitMaster project was born from a simple observation: many people want to improve their physical fitness but do not always have the time, money, or resources to go to the gym or hire a personal coach. Often, they train alone without knowing whether their movements are correct, which can lead to poor results or even injuries. The idea of FitMaster is therefore to make sports coaching **intelligent, accessible, and available anywhere**, powered by artificial intelligence and computer vision.

Mission

FitMaster's mission is to **support each user in real time** during their workouts, just like a human coach would: analyzing movements, correcting posture, giving instant feedback, encouraging, and motivating. FitMaster is not limited to simply counting repetitions; it aims to **improve movement quality** and **protect the health** of those who train.

Vision

FitMaster aspires to be a **universal virtual coach**, capable of democratizing access to high-quality training support. The ambition is to create a platform where anyone, regardless of their level or means, can train safely, effectively, and with motivation. In the long term, FitMaster aims to become a benchmark in **digital coaching**, integrating advanced features such as AI-driven personalization, statistical tracking, injury prevention, and even social and gamified dimensions.

The Problem It Solves

FitMaster addresses several concrete problems:

- People often train alone without knowing if their movements are correct **FitMaster corrects them in real time.**
- Many do not have the means or time for a personal coach **FitMaster offers an affordable alternative.**
- Injuries caused by poor posture are common **FitMaster detects and alerts to prevent risks.**
- Lack of motivation makes it difficult to stay consistent **FitMaster motivates and supports with voice feedback and an interactive chatbot.**

Technologies Used

To bring this vision to life, several technologies have been combined:

- **Flask + Socket.IO (Python backend):** manage real-time communication between the browser and the server.
- **MediaPipe + OpenCV + NumPy:** detect and analyze postures from webcam images.
- **JavaScript (Web Speech API):** provide **live voice feedback** to the user.
- **HTML/CSS/JS:** modern and intuitive interface with gauges, statistics, and a skeleton overlay.
- **Integrated chatbot (Botpress):** answer user questions about exercises, posture, and training advice.