# Formfit: AI Pushup Tracker

## Your Personal Trainer, Powered by Computer Vision

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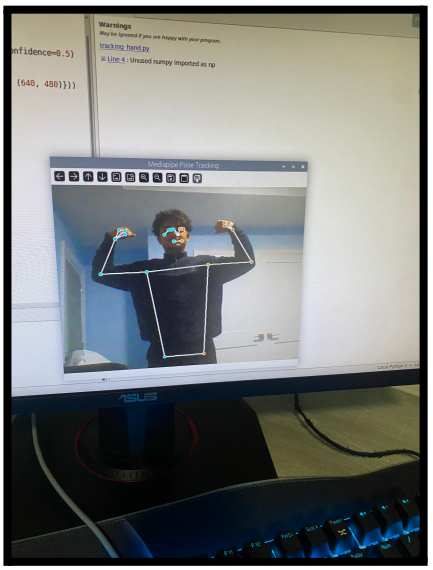
### Overview

We love going to the gym, but a common issue is performing exercises with poor form, leading to injury or suboptimal gains. Since personal trainers can be expensive, we built an AI-powered monitor to evaluate pushup form and provide instant feedback.

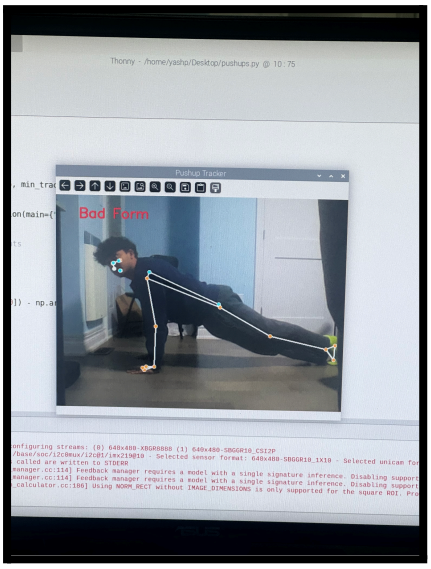
### Key Features

- Real-time pushup form analysis using computer vision
- Instant feedback on form quality based on body position
- Repetition counting with form validation
- Low-cost and efficient implementation on Raspberry Pi




### Technical Approach

Using OpenCV and MediaPipe, we extracted pose key points from over 700 pushups, gathering more than 3.6 million data points. We trained a custom convolutional neural network on these keypoints using the angles and body position for improved generalization. Data augmentation further reduced noise and filtered out unnecessary keypoints.




### Development Process

Built over winter break, we first prototyped the system on a Raspberry Pi 4 using MediaPipe and angle-based logic to assess pushup form. To scale it, we trained a custom AI model on a desktop using landmark data from 90+ videos. A rep detection algorithm tracks body and joint positions to count clean repetitions.

### Tools

- Python
- TensorFlow
- OpenCV
- MediaPipe

### Platform

- Raspberry Pi OS
- Windows

**GitHub**: [github.com/yashp1932/FormFit-AI-Pushup-Tracker](github.com/yashp1932/FormFit-AI-Pushup-Tracker)