AI Fitness Trainer

*Progress Report #5*

# TL; DR

**On track (*Github:***[*AI-FitnessTrainer*](https://github.com/aminuabdusalam/AI-FitnessTrainer)*)***.** Continued build of Trainer – completed trainer for curls exercise by **10/2.**

# Project Goals (Recap)

The goal of the project can be summarized as developing an **AI fitness trainer** embedded with **storage and recommender systems** and an **AI virtual mouse**.

The AI fitness trainer will help the user lose weight, gain muscle, and accomplish other fitness goals. In addition, it'd attempt to understand the client goals, develop a fitness routine, recommend a healthy eating plan, and ensure all exercises are performed correctly.

# Highlights

**Completed trainer for curls exercise (**[**Completed trainer for curls exercise · aminuabdusalam/AI-FitnessTrainer@012f832 (github.com)**](https://github.com/aminuabdusalam/AI-FitnessTrainer/commit/012f832af80b016137e0951b86fecb56791c3363)**)**

* Implemented findAngle between body landmarks on moving image (video).
* Updated findAngle to capture exterior angle because of the need for the angle to be monotonically increasing i.e. with exterior angle, the angle at which curls have to be performed correctly will be greater than tht of when the arms are in initial state.
* Checked min and max angles between arm, elbow and shoulders to confirm are being are done correctly. N.B. [How to Do Bicep Curls: 10 Steps (with Pictures) - wikiHow](https://www.wikihow.com/Do-Bicep-Curls#:~:text=Use%20the%20same%20arm%20motions%20as%20in%20a,curl%2C%20keep%20your%20arm%20close%20to%20your%20body.) and test-by-sight showed that the arm has to be at 45 degrees (315 exterior degrees).
* Count the number of curls person in image does and renders the curl count at the bottom-left in addition to the fps of the image at the top-left of the screen. In addition, a dynamic bar showing the percentage to getting a curl done is rendered at the top-right.A person holding a trophy

  Description automatically generated with medium confidenceA picture containing text, person, wall, indoor

  Description automatically generated

# Lowlights

None

# Next Steps

* Finetune trainer to accommodate for the use of both left and right arm one after the other in completing curls (it currently only checks for the left arm) and complete by **10/10**.
* Set up PoseDetection program to capture video from webcam input ([Pose - mediapipe (google.github.io)](https://google.github.io/mediapipe/solutions/pose#static_image_mode)) and **complete by 10/10**. NB: program currently detects pose in saved images/video.
* Re-evaluate timeline to accommodate for implementation of up to 6 exercises including pushup and squat in an exercise module and creation of website for trainer.
* Kickstart implementation of storage system: login especially by speech [storage system].

# Timeline

This section lists the milestones of the project spread across two semesters (Fall 2022 and Spring 2023).

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| --- | --- | --- | --- |
| **Milestones** | | **ETA** | **Status** |
| **Requirements Gathering** (Project Idea, Project Proposal) | | 08/22 | Completed |
| **Design Exploration** (Setup and Installation of necessary technologies, Addition of Project to remote repo, Skill Preparation, Framework Project) | | 08/29 | Completed |
| **Implementation** | Complete Pose Estimation Build | 09/19 | Completed |
| Complete AI Personal Trainer Build | 10/25 | **In Progress** |
| Partly Complete Storage System Build | 10/31 | Not Started |
| **Quality Testing** | | 11/7 | Not Started |
| **Midpoint Presentation Draft** | | 11/14 | Not Started |
| **Midpoint Demo & Report** | | 11/21 | Not Started |
|  | **WINTER BREAK** | | |
| **Project Review** (Current status and Re-evaluation of Next Steps as Needed) | | 01/16 | Not Started |
| **Implementation** | Complete Storage System Build | 01/30 | Not Started |
| Complete Recommender System Build | 02/20 | Not Started |
| Complete Hand Tracking Build (Stretch Goals) | 03/13 | Not Started |
| Complete AI Virtual Mouse Build (Stretch Goals) | 03/27 | Not Started |
| **Quality Testing** | | 04/3 | Not Started |
| **Final Presentation Draft** | | 04/10 | Not Started |
| Final Demo & Report | | 04/17 | Not Started |