AI Fitness Trainer

*Progress Report #1*

# TL; DR

**On track.** Completed design exploration and set up of development environment by 8/28. Kicked off Implementation of Pose Estimation Build on 8/29.

# 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 design exploration and finalized blueprint of project.
  + [Retrieved](https://transactions.sendowl.com/orders/112171973/download/90138273b175081f4f47b20d56272e56) exercise videos/dataset from [Fitness Basic Dataset – Infinity AI](https://marketplace.infinity.ai/products/fitness-basic-dataset) to use for testing and finetuning the **cv2** model.
  + Decided that the project will primarily focus on exercise such as **Arm Raise**, **Curl, Pushup, and Squat**, but could be extended to Bicycle Crunch, Bird Dog, Fly, Leg Raise, Overhead Press, and Superman in future.
  + The project will include building a pose estimation module, leveraging the pose estimation module to build trainer, building a storage and recommender system (recommend fitness plan based on user’s goal), building a hand tracking module, and leveraging the hand tracking module to build virtual mouse.
* Set up development environment.
  + Installed supported version of Python & [Python Extension](https://marketplace.visualstudio.com/items?itemName=ms-python.python) on System and VSCode respectively.
  + Set up and [connect](https://5minutebi.com/2019/03/14/how-to-setup-vscode-for-python-and-github-integration/#:~:text=1%20Log%20into%20Github.com%2C%20under%20your%20account%2C%20select,cannot%20view%20it%20once%20you%20leave%20the%20page.) project to Github - Here is the GitHub link for the project [aminuabdusalam/AI-FitnessTrainer](https://github.com/aminuabdusalam/AI-FitnessTrainer).
    - Ran into issue with Git Integration of VSCode particularly integration of Personal Access tokens but fixed it.
    - Updated Project’s GitHub with well-detailed description of project.

# Lowlights

None

# Next Steps

* Continue build of module for Pose Estimation and complete by 09/19.
  + Utilize cv2 and mediapipe for capturing video, processing video, and creating model for detecting pose.
  + Model would be able to identify all 33 landmarks on the human body, find pose, and find angle.

# 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 | **In Progress** |
| Complete AI Personal Trainer Build | 10/25 | Not Started |
| 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 |