# SocialPlay: Workout Challenge

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## ABSTRACT

- **Workout-Challenge Platform**
Groundbreaking platform merging physical activity with social media engagement.

- **Real-time Motion Tracking**
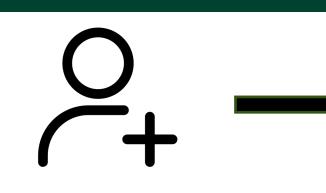Utilizes computer vision technology and camera for real-time users' workout movements.
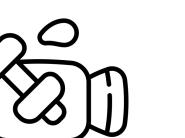
- **Objective Scoring**
Provides objective scores based on the level of stage and users' accomplishments.
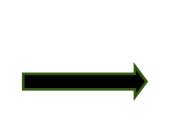
- **Social Media Sharing**
Effortlessly share progress and achievements on Instagram, offering a dynamic and interactive experience celebrating the genuine talent and hard work of users.

## PROJECT DESCRIPTION



Sign Up → Game Play & Recording → Scoring & Sharing
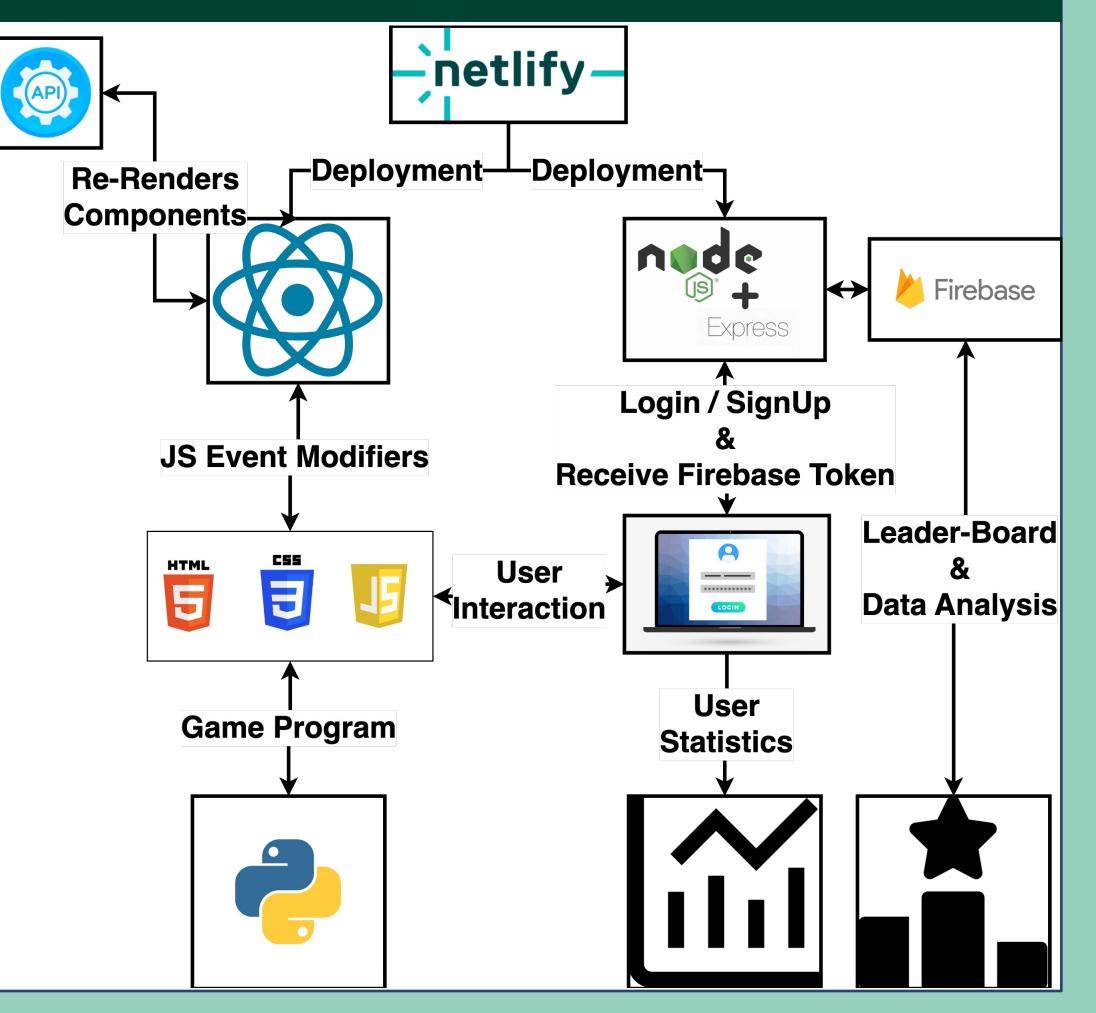
- **Sign Up:** user's biography.
- **Game Play & Recording:**
adjust the level, play the game & record the game screen.
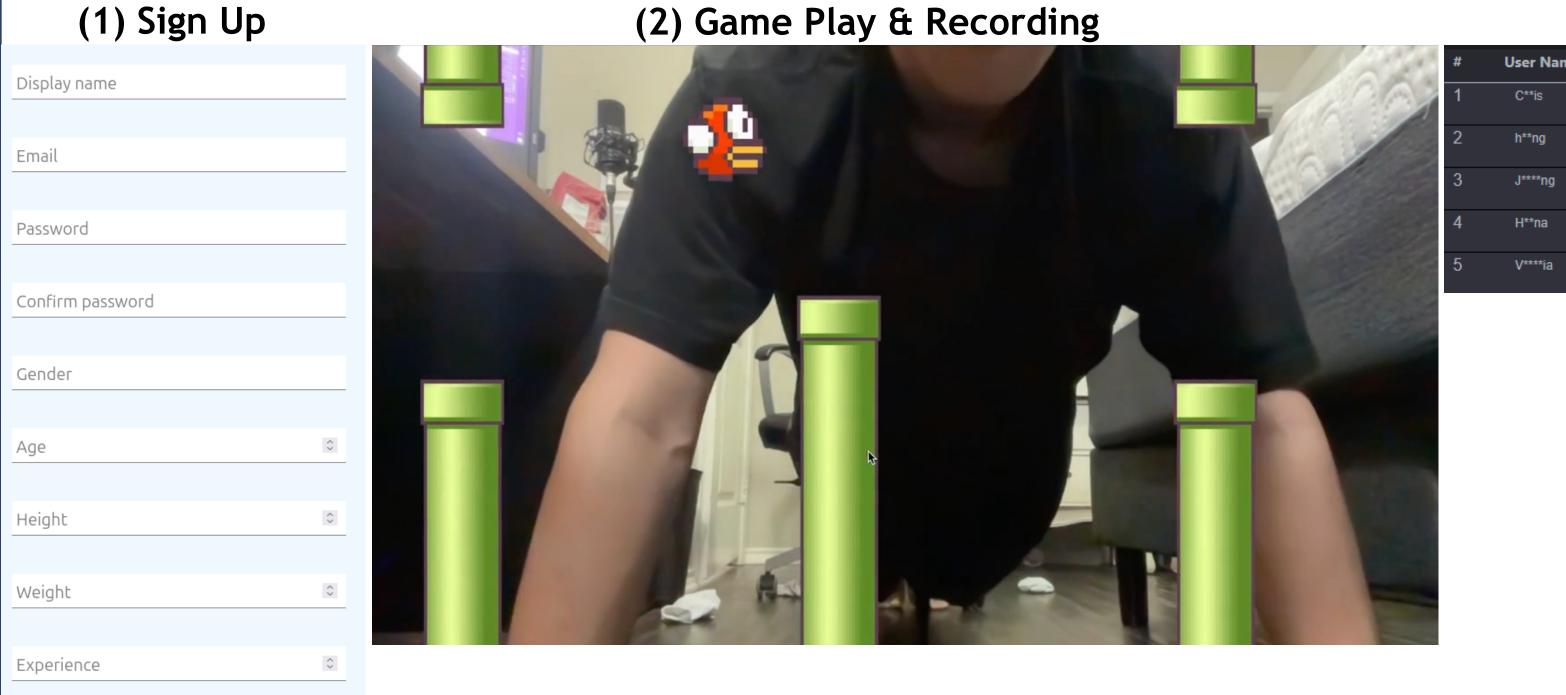- **Scoring & Sharing:** share to social media.

## KEY PROJECT GOALS

- Develop a workout challenge game.
- Allow users to share their performance on social media.

## ARCHITECTURE



Re-Renders Components
Deployment — Deployment
JS Event Modifiers
Login / SignUp & Receive Firebase Token
User Interaction
Game Program
Leader-Board & Data Analysis
User Statistics

## APPLICATION IN USE

**(1) Sign Up**



Display name
Email
Password
Confirm password
Gender
Age
Height
Weight
Experience

SIGN UP

**(2) Game Play & Recording**



**(3) Scoring & Sharing**

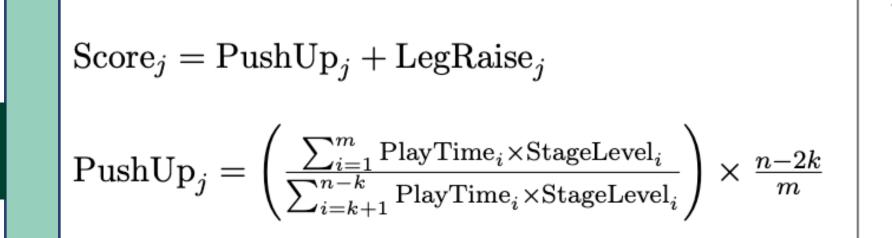| # | User Name | Score | Gender | Age | Height | Weight | Experience |
|---|-----------|-------|--------|-----|--------|--------|------------|
| 1 | C**is | 49 | M | 32 | 5.9 | 170 | 8 |
| 2 | h**ng | 41 | M | 37 | 5.8 | 150 | 5 |
| 3 | J****sg | 37 | M | 22 | 6.1 | 170 | 2 |
| 4 | H**na | 36 | F | 35 | 5.6 | 140 | 8 |
| 5 | V****ia | 28 | F | 23 | 5.5 | 130 | 3 |

Name: hoang
Email: hoang1@gmail.com
Gender: M
Age: 37
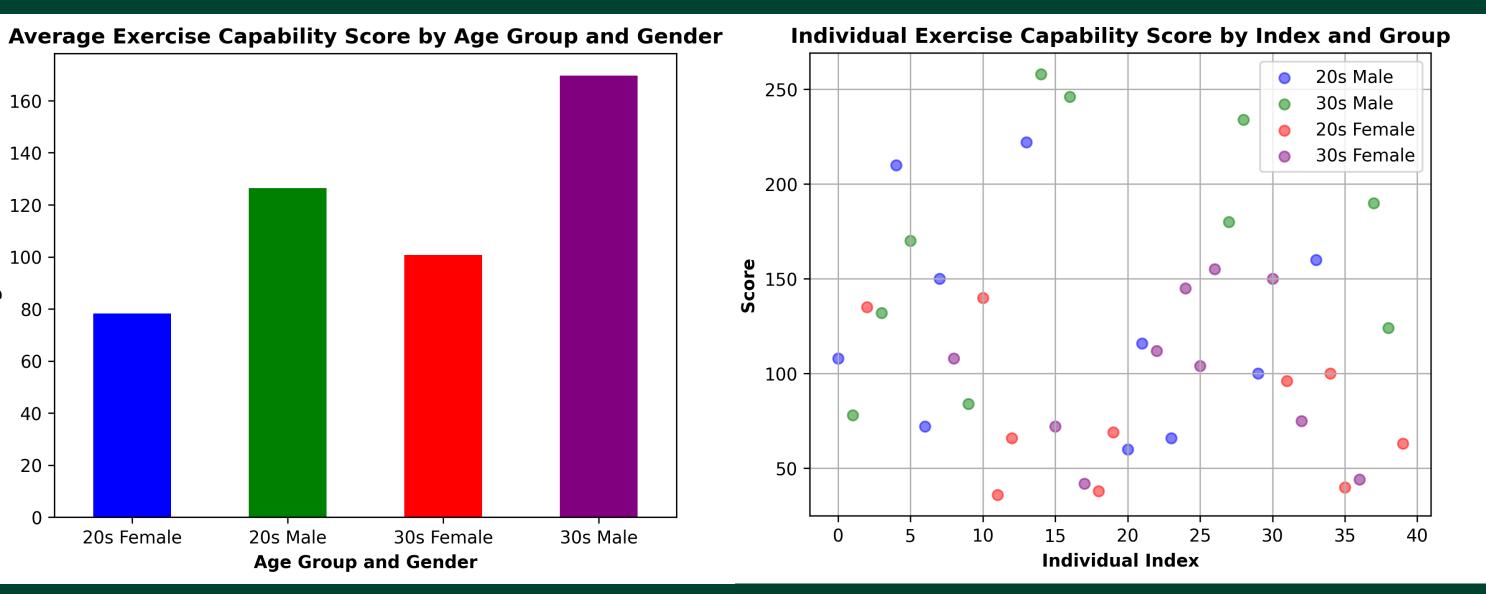Height: 5.8
Weight: 150
Experience: 5
Score: 41

**(1)** - Users input their name, email, password, gender, age, height, weight, and exercise experience.

**(2)** - Users select the exercise type (here, push-ups) and stage level (difficulty). The exercise types include push-ups and hanging leg raises. The higher the stage level, the faster the obstacles move.

- In the case of push-ups, the character (a red bird) tracks the shoulders. The game ends when this bird collides with obstacles. The game screen is recorded and later used for social media sharing purposes.

**(3)** - According to the scoring metrics, if you rank among the top 5, your performance is uploaded to the leaderboard.

- If a user wants to share their gameplay video, they can do so on Facebook.

## SCORING METRICS

$$\text{Score}_j = \text{PushUp}_j + \text{LegRaise}_j$$

$$\text{PushUp}_j = \left( \frac{\sum_{i=1}^{m} \text{PlayTime}_i \times \text{StageLevel}_i}{\sum_{i=k+1}^{n-k} \text{PlayTime}_i \times \text{StageLevel}_i} \right) \times \frac{n-2k}{m}$$

$Where:$
$j$: User's name
$m$: Number of plays by the j
$n$: Total number of plays
$k$: 10% of n, indicating outliers

- The score is calculated by summing the normalized scores of each game.
- These scores are used for the leaderboard and data analysis.

## DATA ANALYSIS


Average Exercise Capability Score by Age Group and Gender


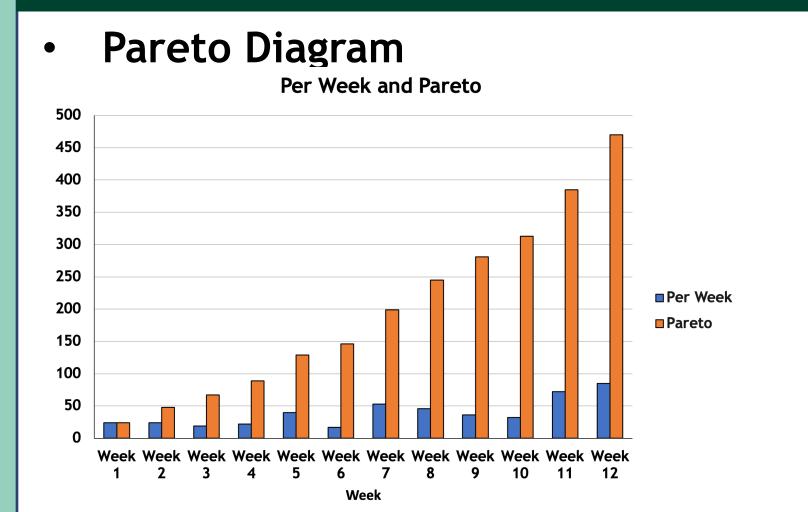Individual Exercise Capability Score by Index and Group

- **Bar chart illustrating the average exercise capability scores by age group and gender.**

- Males in their 30s have the highest average exercise capability, which is 35% higher than that of males in their 20s.

- **Scatter plot representing individual exercise capability scores.**

- Some men in their 20s and women in their 20s and 30s outperform men in their 30s in exercise.

## COMMUNITY ISSUES

- **Security and Privacy Issues:** We collect user data for analysis, including gender, age, height, and weight. This raises concerns, but we have taken steps to protect privacy by anonymizing usernames and encrypting passwords.

- **Ethical Issues:** We analyze group physical abilities by gender and age, which could create biases against certain groups in society. To address this ethical risk, we only analyze the top-performing groups.

- **Impact Issues:** Over-competition can cause injuries from excessive exercise. However, advocating moderation fosters a healthier society.

## PROJECT MANAGEMENT

- **Pareto Diagram**


Per Week and Pareto

- **Key Roles**

| Documentation | Andrew |
|---|---|
| Point of Contact | Het |
| Front-end | Het, Santana, Hoang |
| Back-end, Database | Hoang |
| ML & Data Analysis | Andrew, Jihyung, Jeongsik |

- **Communication Plan**

**Group Meetings:** Virtually every Friday, with in-person sessions in March and April to tackle issues. Communication continues via Discord channel.

**Subgroup Meetings:** Each team met separately once a week virtually. Meetings were held on MS Teams, communication via Discord, documentation on Google Cloud, and code storage on GitHub.

- **Risk Analysis / Contingency Plans**

- Obstacles in converting object recognition for web use and obtaining permissions.

- Split the project: 1) utilizing the website for visualization and user registration, and 2) developing the game as a standalone PyGame app.

- **Evaluation / Tracking Plan**



## CONCLUSIONS

- We developed a workout platform by tracking user poses, enabling users to showcase capabilities and share achievements on social media.

- Our user data analysis reveals males in their 30s with extensive exercise experience demonstrate the highest performance levels.

## FUTURE WORKS

- Introduce additional exercises beyond push-ups and leg raises to enhance user engagement.

- Create an algorithm to analyze users' scores and suggest personalized recommendations for their skill levels.