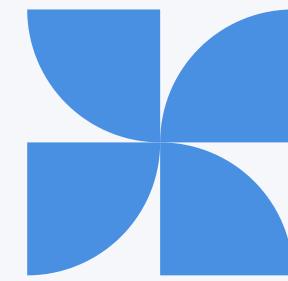


# RepWise - Your Digital Spotter



Duke AI Hackathon 2025 | Health & Wellness

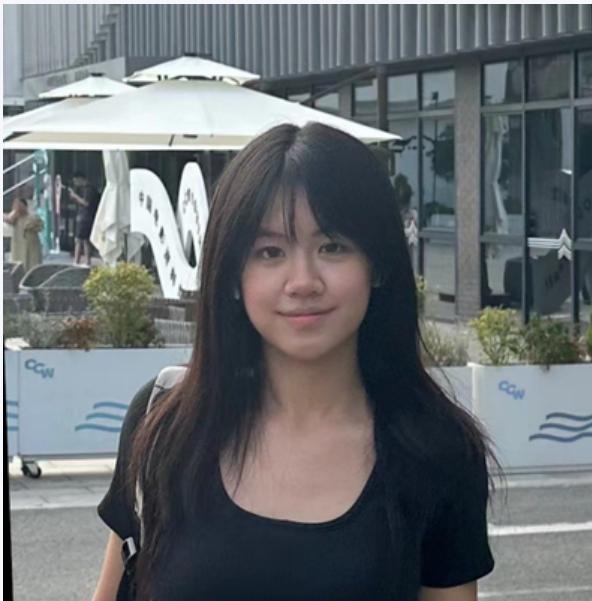
Shagun Sharma, Sampath Kasina, Sudhire Rahul Karunakaran and Sandy Hou

,

# Meet the Team



**Shagun Sharma**  
MQM - Fuqua



**Sandy Hou**  
Applied Math CS - DKKU



**Sampath Kasina**  
CS - NC State



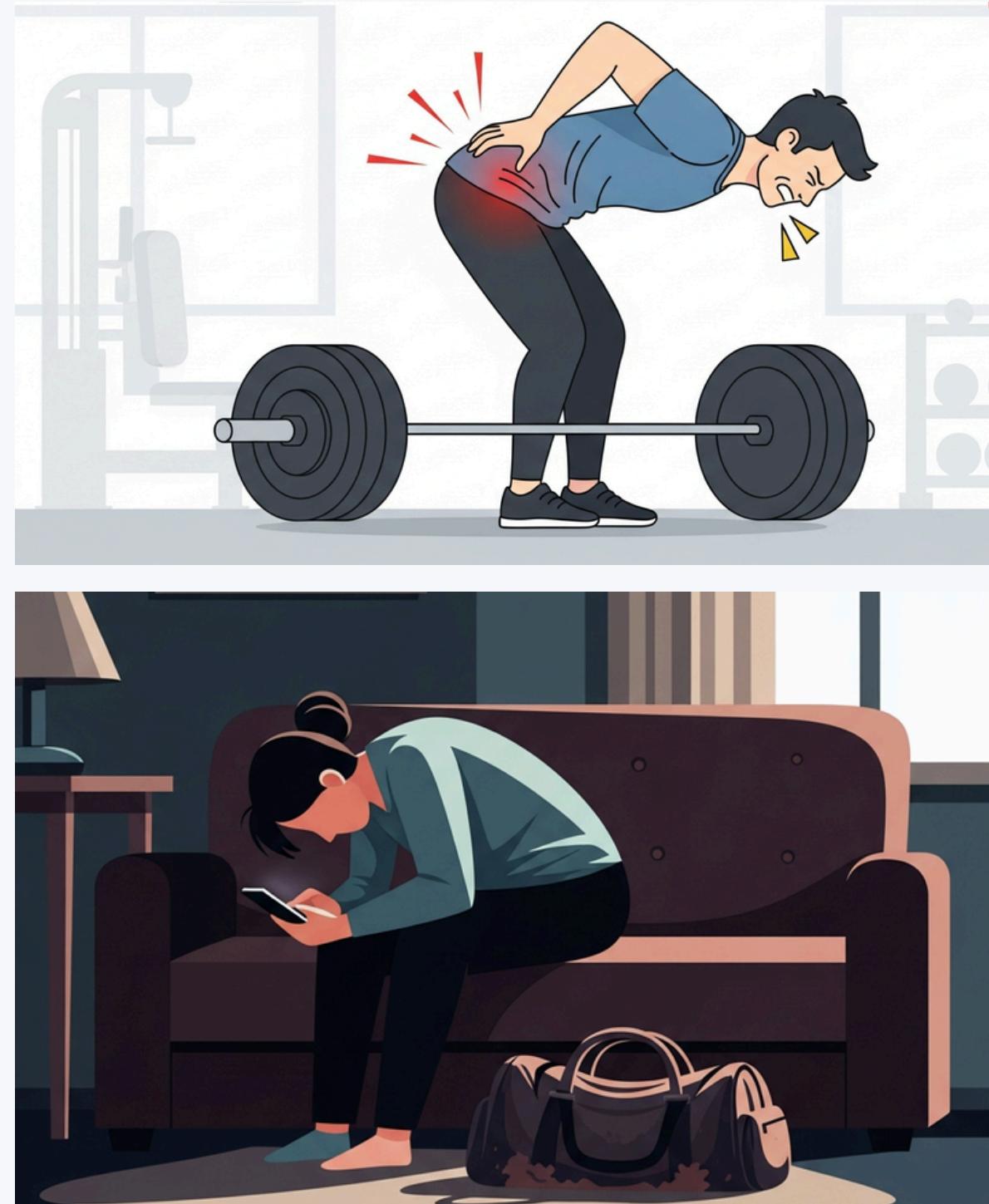
**Sudhire Karunakaran**  
MEM - Pratt

# The Problem

## High Cost of Bad Form

**85% of Fitness Journeys Fail Due to Injury or Lack of Progress**

Problem	Impact	RepWise Solution
<b>Injury Risk</b>	❗ Incorrect form is the #1 cause of gym injuries.	Real-time, video-based form correction.
<b>Stalled Progress</b>	✗ Users don't know <i>why</i> they aren't getting stronger.	Precise quantification of workout quality and depth.
<b>High Cost of Coaching</b>	💰 Personal trainers are expensive (\$50+/hr) and not always available.	Accessible, 24/7 expert feedback for the price of an app.

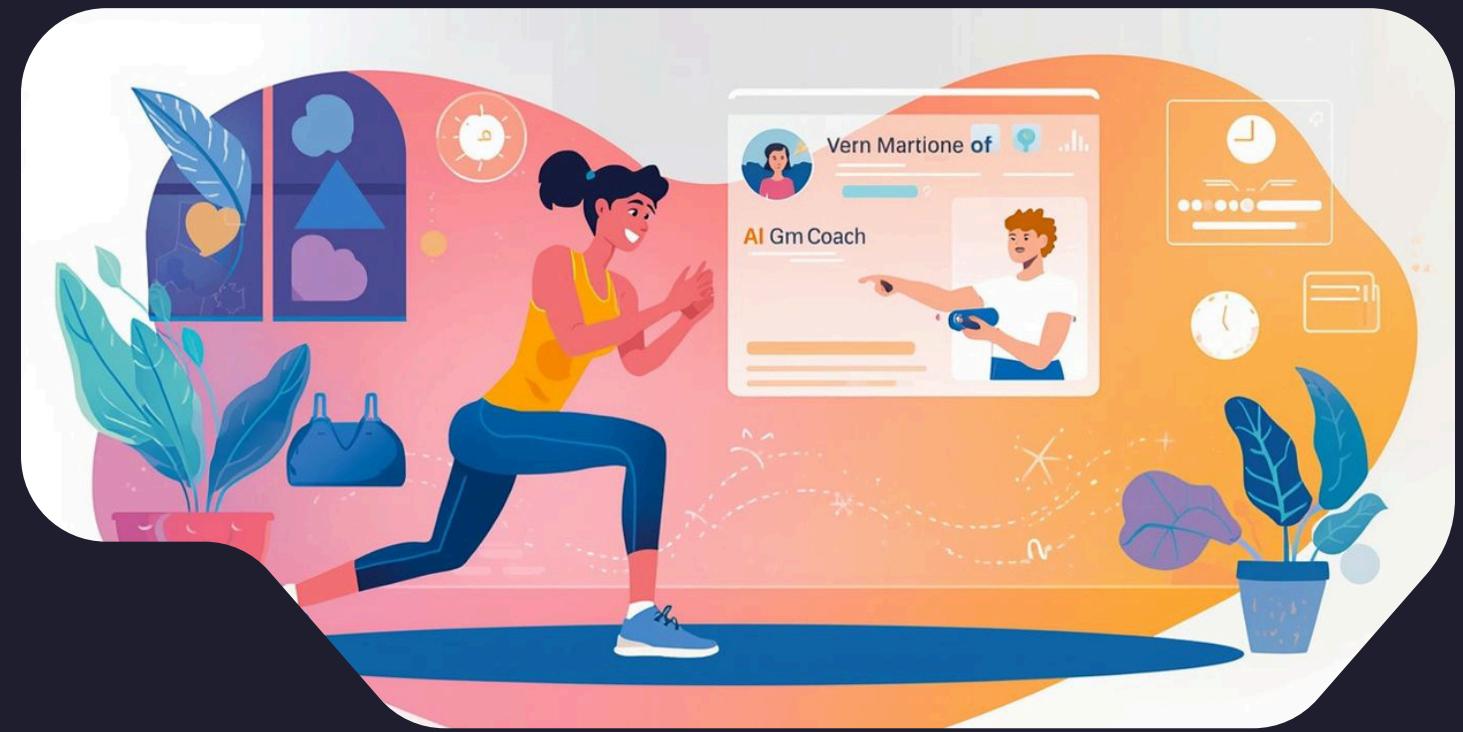
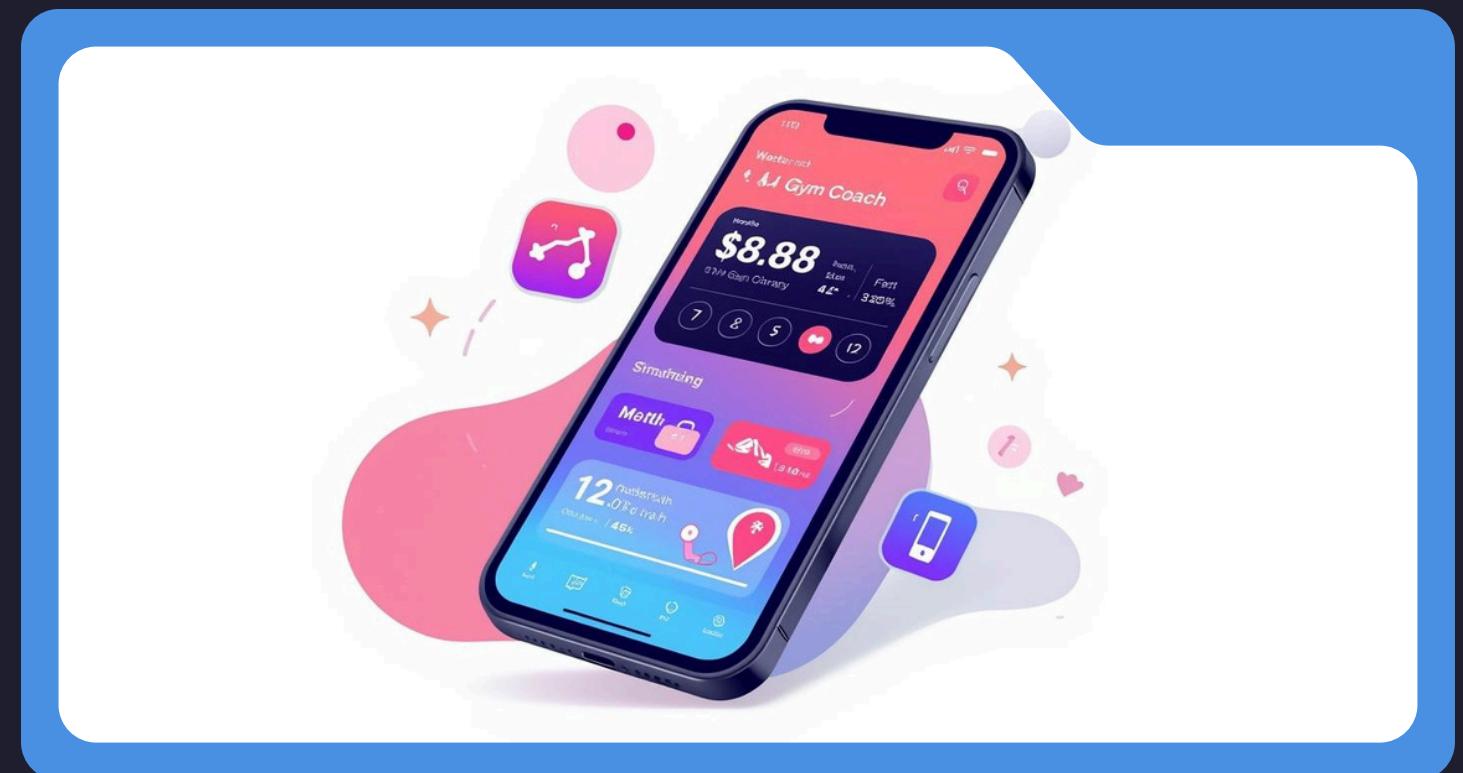


# Our Solution

## Real-time, Data-Driven Correction

RepWise provides non-stop, visual, and verbal feedback on every rep.

- **Visual Guide:** Overlay skeletal tracking and angle lines directly onto the video feed.
- **Dynamic Feedback:** Immediate, actionable advice ("Squat deeper," "Lift your chest up").
- **Automated Rep Counting:** Accurate tracking across complex, multi-stage exercises like Good Mornings and Split Squats.
- **The Difference:** We don't just count reps; we grade them.



# Key Features



## Real-Time, Multi-State Form Coaching

RepWise moves beyond simple rep counting by using real-time AI form analysis backed by a 3-State Machine (UP / DOWN / RECOVERING).

- **What it does:** It tracks the 3D position of key joints (Hip, Knee, Ankle, Shoulder) during complex movements (like Good Mornings and Air Squats) to confirm the user hits the precise depth required and maintains proper spinal angle throughout the entire range of motion.
- **Unique Value:** The multi-state engine ensures a rep is only validated and counted when the user successfully transitions through the maximum eccentric phase (DOWN) and returns to the full lockout (UP).



## Dynamic, Actionable Visual and Verbal Feedback

The app provides non-stop guidance to correct form as it happens.

- **Visual Feedback:** It overlays skeletal tracking and angle lines directly onto the user's video feed, changing color (e.g., Green for good, Red for bad) to visually flag errors.
- **Verbal Feedback (TTS Cooldown):** It uses Text-to-Speech (TTS) to provide immediate, actionable instructions like "Squat deeper" or "Lift your chest up," but manages the frequency to prevent distraction (Latency/Reliability check).



## Pre-Workout Visibility & Angled View Reliability

The system is engineered to work reliably in non-ideal home gym environments.

- **Visibility Guardrail:** The app enforces a pre-workout full-body visibility check (tracking the Nose and Ankles) to ensure accurate landmark tracking before a set begins.
- **Angled View Tolerance:** By using 3D landmark coordinates and customized angle thresholds (as seen in our fixes for the diagonal stance), the app provides reliable coaching even when the user is not perfectly side-on to the camera.

# Benefits



## Personalized plans keep you engaged and motivated

Customized workouts to meet your unique fitness goals.



## Optimize your workouts for faster and better results

Tailored feedback enhances performance during each session.



## Access expert coaching anytime, anywhere for convenience

Professional guidance available through your mobile device.



## Workout from home or the gym with ease

Flexibility to train wherever suits your lifestyle best.

# Product Overview: The User Journey

**From Selection to Success, guided by AI.**

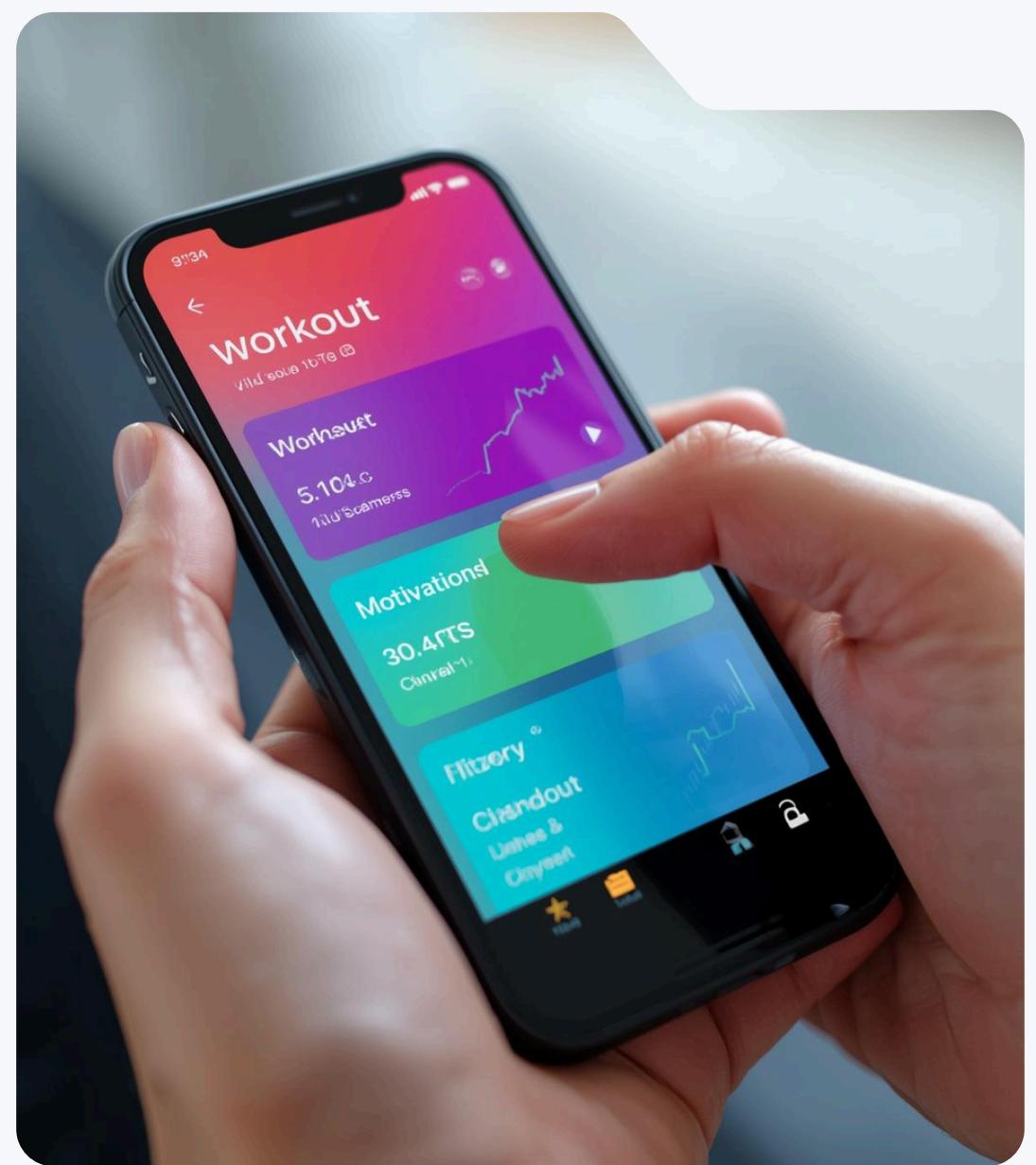
- 1. Selection:** User selects an exercise (e.g., Free Squat) from a comprehensive library.
- 2. Setup:** The app confirms full-body visibility before allowing the workout to begin.
- 3. Live Coaching:** The user performs the exercise while the AI checks key joint angles (Knee, Hip, Torso) against optimal thresholds in real-time.
- 4. Analysis:** After the set, the app provides a detailed Form Score and specific recommendations for improvement.





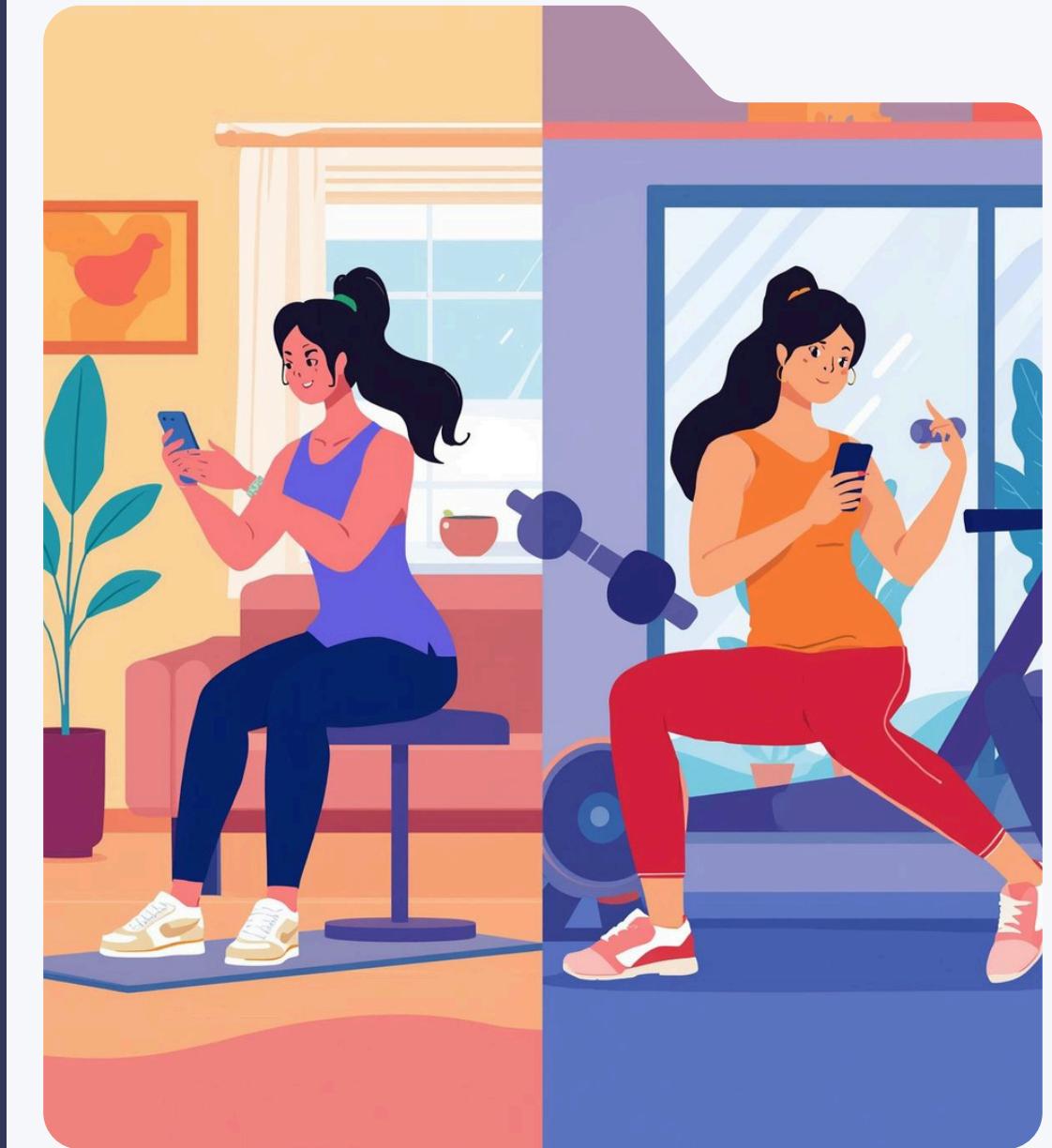
85%

**Users report increased motivation**



95%

**Success in achieving fitness goals**



3 plans

**Flexible pricing options available**

# Pricing



# Basic

# Foundation & Setup:

Access to the core exercise library, detailed tutorial videos, and setup cues for proper posture before a workout.

# FREE





# Standard

# Real-Time Coaching:

All Basic features PLUS: Live AI Form Correction during workouts, Video Recording of sessions, Upload Video for Detailed Report, and comprehensive progress tracking.

*Digital personal trainer at a fraction of  
the cost.*

**\$5.99 per month**



# Premium

## Personalized Coaching:

All Standard features PLUS: Paired with a Real Human Personal Coach, Custom routine and design plan, and Direct messaging and personal guidance.

*Hybrid AI + Human coaching for guaranteed results and accountability.*

**\$14.99 per month**

# Why Choose Us?



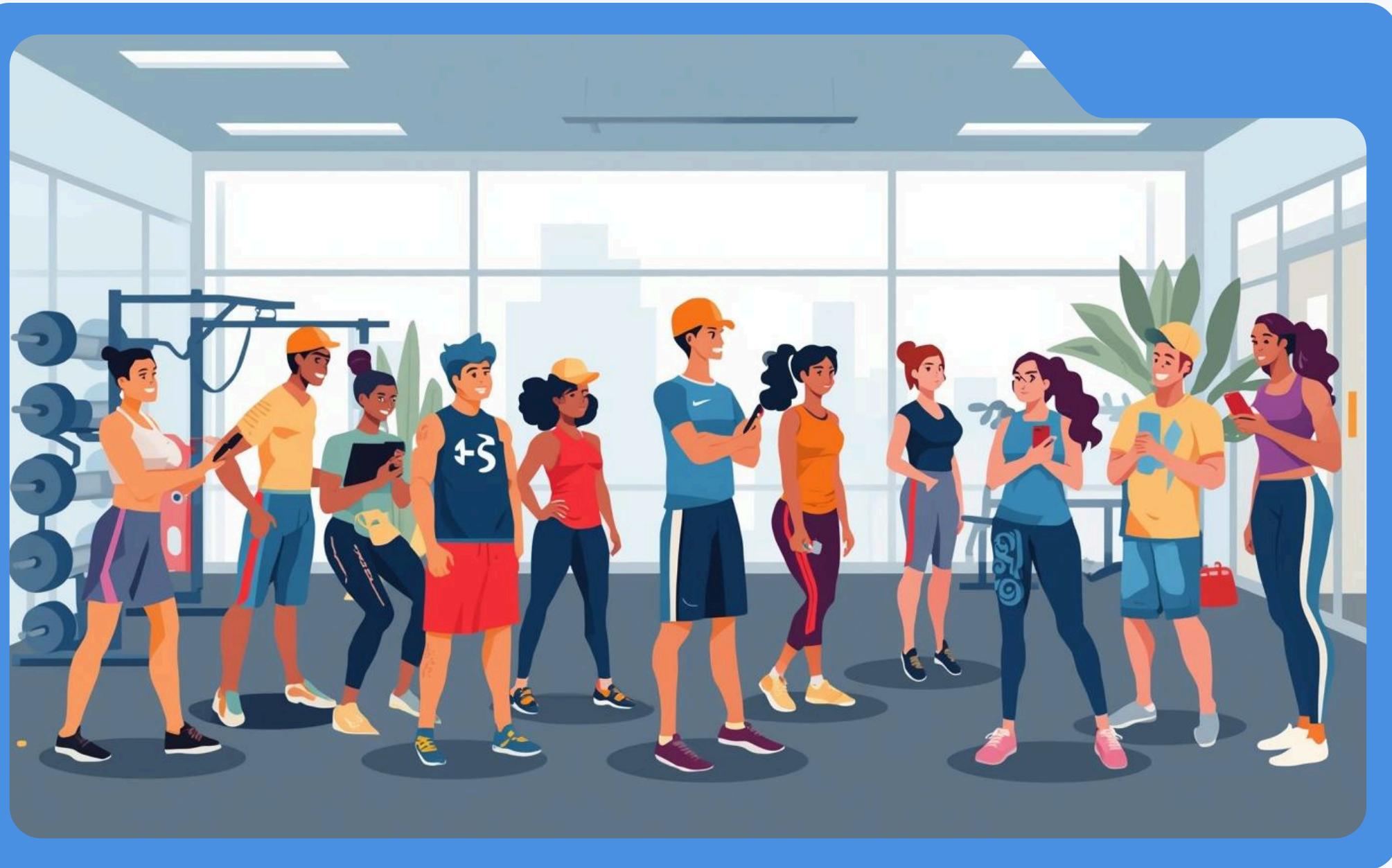
## Personalized

- Tailored for your goals
- Adjusts to your progress
- Flexible workout schedules
- Engaging and motivating content

## Expert

- Access to top trainers
- Real-time feedback provided
- Proven workout techniques
- Support for all levels

# Market Opportunity & Target



The rapidly growing Digital Fitness market.

- **TAM (Total Available Market):** \$15 Billion (Global Fitness App Market, 2024).
- **SAM (Serviceable Available Market):** \$4 Billion (Market for AI-Powered Coaching and Form Correction).
- **Target Users:**
  - **Home Gym Enthusiasts:** Need guidance without a trainer.
  - **Rehabilitation/Prehab:** Users focused on low-impact, perfect form (Physiotherapist recommendation).
  - **Gym Newcomers:** High risk, high desire for guidance.

# Competitive Advantage

**RepWise goes deeper than basic rep counting.**

Feature	Basic Fitness App (e.g., Google Fit)	Dedicated Video App (e.g., Form Checkers)	RepWise
<b>Real-Time Coaching</b>	No	Limited, often delayed	<b>YES (Visual &amp; Verbal TTS)</b>
<b>Angled/Diagonal View</b>	Fails tracking/gives false negatives	Requires perfect side-on view	<b>YES (3D Landmark Angle Calculation)</b>
<b>Complex Exercise Logic</b>	Counts only simple movements	Rudimentary depth checks	<b>YES (3-State Machine: Up, Down, Recovering)</b>
<b>Pre-Workout Visibility Check</b>	No	No	<b>YES (Ensures full-body tracking)</b>

# Technology: The AI Core



Utilizes YOLO for highly accurate, real-time 3D coordinate estimation of 33 body landmarks.

- **Core Logic:** Custom-built Python code (CV2, NumPy) running a Multi-State Repetition Engine.
  - **3-State Machine (UP / DOWN / RECOVERING):** Guarantees that a rep is only counted when the full range of motion, including hitting max depth, is achieved.
  - **Dynamic Thresholds:** Angle thresholds are fine-tuned for each exercise and compensate for non-ideal camera angles.

# Contact Us



## Email

shagun.sharma@duke.edu



## Social Media

Shagun Sharma

# Thank You!

**RepWise - Your Digital Spotter**

