**Interactive Strength Training Device**

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### Project Description

**Objective:**
The main objective of this project is to create an interactive piece of gym equipment that will guide the user through structured workouts, and ensure proper form during exercises.

**Design**

**Primary Functions:**
- Provide variable and challenging workouts
- Guide users through structured workouts
- Track body motions through the use of SONAR and INFRARED sensors
- Perform ergonomic calculations to determine ranges of motion to ensure proper form
- Display results at the end of each workout

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**Ergonomic Modeling**

Link length factors used to determine ranges of motion relative to the user's height.

Accurate for user heights between 5'0" and 6'9".

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### System Diagram

1. Determine user's height
2. Perform calculations to determine body link lengths
3. Calculate ranges of motion for each exercise
4. Receive muscle group/specific workout input from user
5. Run selected workout
6. Display results

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### Workout Programs

- Legs
- Chest
- Back
- Biceps/Triceps
- Shoulders
- Cross-Fit

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### Conclusion

This workout mechanism allows users to improve their physical health through means of providing challenging workouts while maximizing the benefits from each exercise.