



# Exercise Pose Correction: Leveraging Mediapipe for Fitness Analysis

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# Pose Detection with Mediapipe

## Landmark Tracking

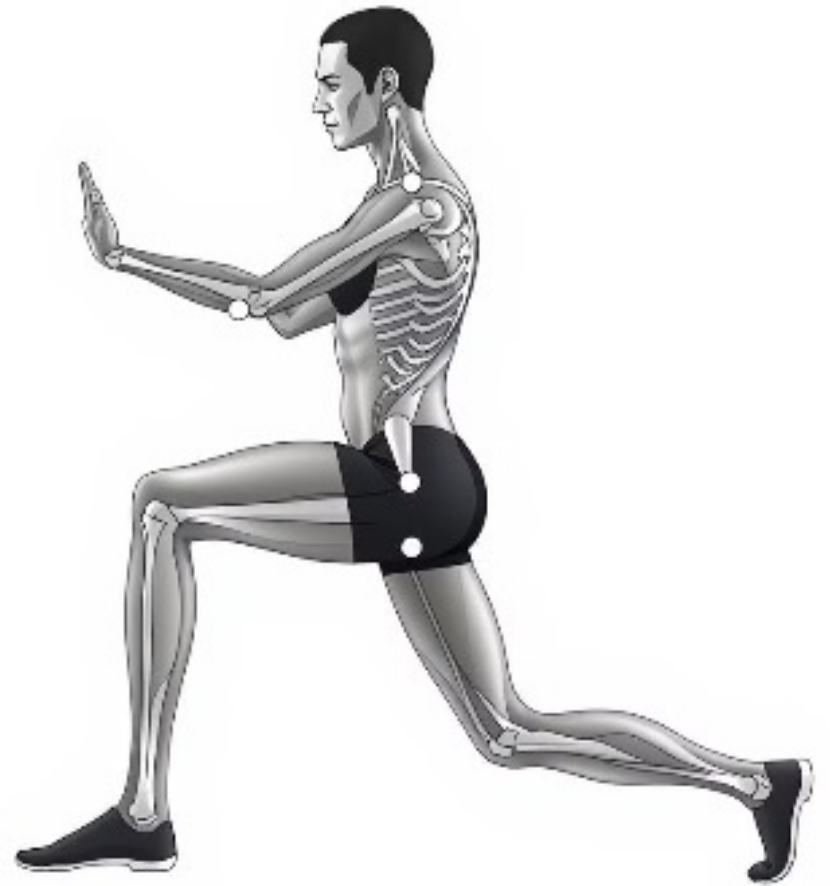
Mediapipe's pose estimation models can precisely track 33 key body landmarks, enabling detailed analysis of exercise form.

## Real-Time Processing

The pose detection algorithms operate in real-time, processing video frames and updating landmark positions continuously.

## Versatile Applications

This technology can be applied to a wide range of exercises, making it a powerful tool for fitness analysis and feedback.





# Dataset Creation: Self-Recorded Exercise Videos

1

## Video Capture

Participants recorded themselves performing the target exercises, ensuring a diverse dataset.

2

## Pose Labeling

The recorded videos were processed to extract and label the key body landmarks for each exercise.

3

## Data Curation

The labeled data was thoroughly reviewed and organized for effective model training and evaluation.





# Machine Learning Models: Bicep Curl, Plank, Squat, and Lunge

## Bicep Curl

A model to detect proper elbow, shoulder, and wrist positioning during the bicep curl exercise.

## Plank

A model to analyze body alignment and core engagement during the plank exercise.

## Squat

A model to identify correct knee, hip, and ankle positioning during the squat exercise.

## Lunge

A model to assess front and back leg alignment and core stability during the lunge exercise.

# Model Training and Evaluation

1

## Data Preprocessing

The collected exercise videos were preprocessed, normalized, and split into training and validation sets.

2

## Model Development

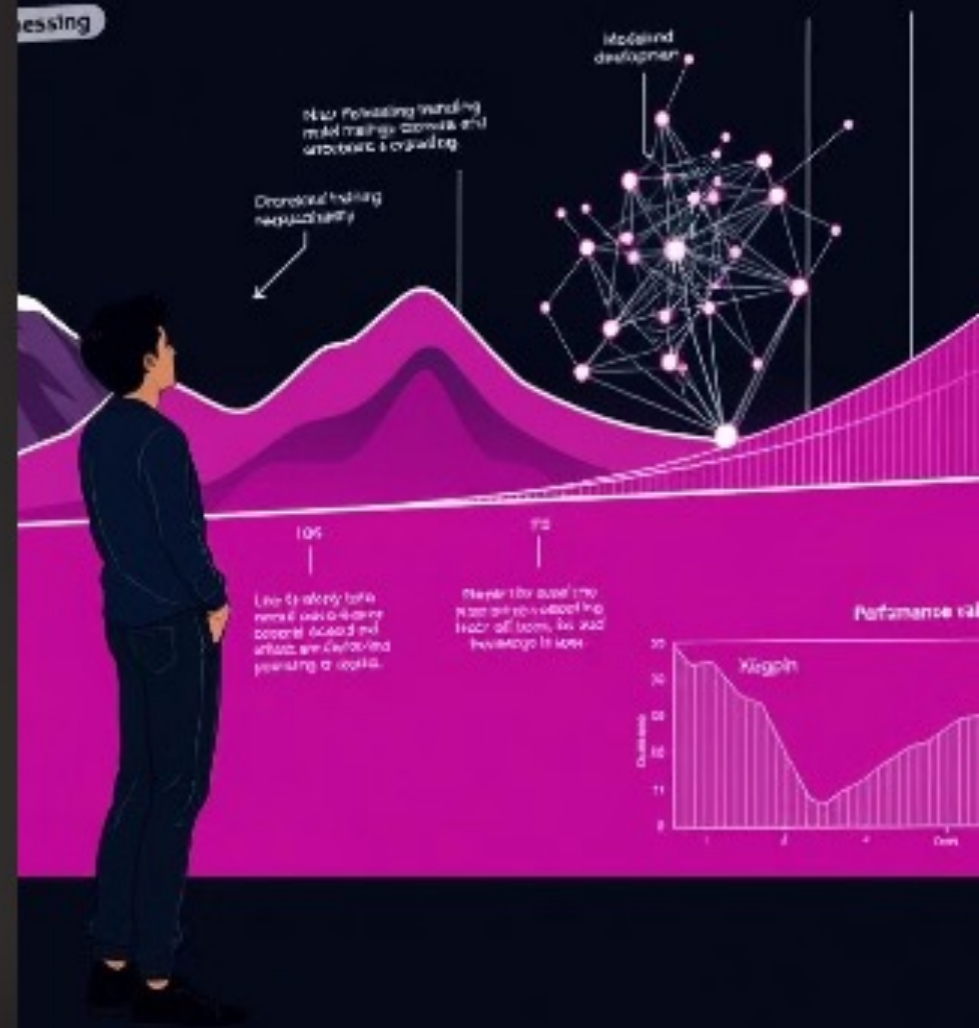
The machine learning models were designed and trained using advanced techniques such as deep learning.

3

## Performance Evaluation

The models were extensively tested and validated to ensure accurate pose detection and feedback.

Processing





Straighten your back  
feedback

# Web Application: Vue.js and Django



## Video Upload

Users can upload their exercise videos for analysis.



## Pose Detection

The app leverages the trained machine learning models to analyze the exercise form.



## Feedback

Users receive real-time feedback on their exercise technique and areas for improvement.



# Conclusion and Future Enhancements

1

## Expanded Exercises

Develop models for a wider range of exercises to provide comprehensive fitness analysis.

2

## Personalized Recommendations

Incorporate user data and preferences to offer personalized exercise suggestions and guidance.

3

## Integrated Platforms

Integrate the pose correction technology with popular fitness apps and wearable devices.



**THANK YOU**